WIN A SPORTS CAR IN BIG $20,000 CONTEST!

MECHANIX ILLUSTRATED

THE HOW-TO-DO MAGAZINE

25c
JUNE

TEST PILOT DESIGNS AMAZING AUTOMOBILE FLYING BOAT—Page 84

Gurney Miller

Special Section: HOW TO FOR ... TELY

LOW-COST COOLING FOR YOUR HO ... ARS

51028S 31A 8 23 1157
MR O MILLARD
34 50 41ST ST APT 08
ASTORIA L W Y

See what DEPENDABILITY has done for Eve!

No Other

OUTBOARD MOTOR IS BUILT LIKE A JOHNSON SEA-HORSE. NONE! THE MANUFACTURER WHO HAS BUILT MORE OUTBOARD MOTORS THAN ANYONE ELSE, HAS MORE EXPERIENCE IN BUILDING THEM BETTER. THAT'S

Johnson!

9 MODELS · THE JAVELIN (30 hp.)
SEA-HORSE 30, Electric or Manual
SEA-HORSE 15, Electric or Manual
SEA-HORSE 10 · SEA-HORSE 7½
SEA-HORSE 5½ · SEA-HORSE 3

The Johnson Sea-Horse is a *family* motor. For a very good reason. It's DEPENDable. Ask commercial users. They choose Johnsons, and *work* them—hour after hour, year after year—*the very same models you buy for pleasure!* Yes—DEPENDability makes Johnson the family motor. See the nine new models for '56—all smartly styled in Johnson's new Holiday Bronze—all *quiet*—and featuring quicker, smoother starting than you've ever known before!

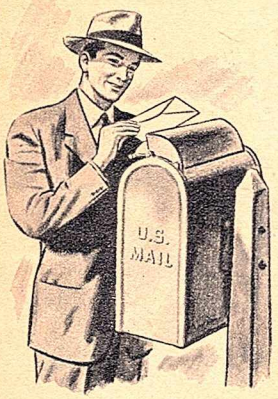
FREE! Write for the Sea-Horse Booklet on 1956 models and features. Complete, factual, helpful.

JOHNSON MOTORS, 200 Pershing Rd., Waukegan, Illinois
A DIVISION OF OUTBOARD, MARINE & MANUFACTURING COMPANY
In Canada: Manufactured by Johnson Motors, Peterborough

Johnson SEA-HORSES ARE DEPENDABLE

Cast your ballot for a successful future!

256 I.C.S. COURSES



Whether you stand at a machine or sit at a desk . . . whether you're making $75 a week or $75 hundred a year . . . whether your interest is Power Plants or Paper Pulp, Advertising or Electronics . . . chances are I.C.S. has exactly the course you need to get ahead.

I.C.S. is not only the oldest and largest correspondence school. It also offers the most courses. 256 in all. Each one success-proved by graduates who rose to top technical and administrative positions. Chief engineers. Superintendents. Foremen. Managers. Executive assistants.

I.C.S. Courses cover bedrock facts and theory plus practical, on-the-job applications. No skimping. Texts are prepared by leading business and industrial authorities working with I.C.S. editors and educators. They are constantly being reviewed and revised in line with current developments.

As an I.C.S. student, you study in your spare time, set your own pace. No time lost getting to class or waiting for slower students to catch up. If you wish, I.C.S. will make progress reports to your employer. You win recognition as a "comer," one who is ready to move ahead. Thousands of students report pay increases and promotions within a few months of enrollment. All graduates win the coveted, approved I.C.S. diploma.

3 FREE BOOKS! Check the subject that interests you in the coupon below. I. C. S. will rush you (1) a special book outlining your opportunities in this field, (2) the 32-page gold mine of career tips, "How to Succeed," (3) a sample I. C. S. lesson (Math.) demonstrating the famous "I. C. S. Method." "X" MARKS OPPORTUNITY.

For Real Job Security—Get an I. C. S. Diploma! **I. C. S., Scranton 9, Penna.** Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS — 65TH YEAR

BOX 23382E, SCRANTON 9, PENNA.

(Partial list of 256 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning—Refrig.
- ☐ Architecture
- ☐ Architectural Interiors
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Building Maintenance
- ☐ Carpentry and Mill Work
- ☐ Heating
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Cartooning
- ☐ Commercial Art
- ☐ Fashion Illustrating
- ☐ Magazine Illustrating
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Auto Body Rebuilding
- ☐ Auto Elec. Technician
- ☐ Auto-Engine Tune Up
- ☐ Automobile Mechanic

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Advertising
- ☐ Bookkeeping and Accounting
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Public Accounting
- ☐ Creative Salesmanship
- ☐ Federal Tax
- ☐ Letter-writing Improvement
- ☐ Office Management
- ☐ Professional Secretary
- ☐ Retail Business Management
- ☐ Sales Management
- ☐ Stenographic-Secretarial
- ☐ Traffic Management

CHEMISTRY
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Natural Gas Prod. & Trans.
- ☐ Petroleum Engineering
- ☐ Plastics
- ☐ Pulp and Paper Making

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Reading Struct. Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Mine Surveying and Mapping
- ☐ Plumbing Drawing and Estimating
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrical Maintenance
- ☐ Electrician ☐ Contracting
- ☐ Lineman

HIGH SCHOOL
- ☐ Commercial ☐ Good English
- ☐ High School Subjects
- ☐ Mathematics

LEADERSHIP
- ☐ Foremanship
- ☐ Industrial Supervision
- ☐ Leadership and Organization
- ☐ Personnel-Labor Relations

MECHANICAL AND SHOP
- ☐ Gas—Electric Welding
- ☐ Heat Treatment ☐ Metallurgy
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Supervision
- ☐ Internal Combustion Engines
- ☐ Machine Design-Drafting
- ☐ Machine Shop Inspection
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration
- ☐ Sheet Metal Worker
- ☐ Tool Design ☐ Toolmaking

RADIO, TELEVISION
- ☐ Industrial Electronics
- ☐ Practical Radio TV Eng'r'ng
- ☐ Radio and TV Servicing
- ☐ Radio Operating
- ☐ Television Technician

RAILROAD
- ☐ Air Brake Equipment
- ☐ Car Inspector
- ☐ Diesel Engineer & Fireman
- ☐ Section Foreman

STEAM AND DIESEL POWER
- ☐ Combustion Engineering
- ☐ Diesel—Elec. ☐ Diesel Eng'g
- ☐ Electric Light and Power
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Finishing and Dyeing
- ☐ Loom Fixi'g ☐ Textile Des'ing
- ☐ Textile Eng'r'g ☐ Throwing
- ☐ Warping and Weaving

MISCELLANEOUS
- ☐ Domestic Refrigeration
- ☐ Marine Engineering
- ☐ Ocean Navigation
- ☐ Professional Engineering
- ☐ Short Story Writing
- ☐ Telephony

Name_____ Age_____ Home Address_____

City_____ Zone_____ State_____ Working Hours_____ A.M. to P.M._____

Occupation_____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

Mechanix Illustrated

A FAWCETT PUBLICATION

SPECIAL FEATURES

Control The Weather And Control The World ..... *Dick Halvorsen* 49
Car Outlook For 1957 ..... *Stanley H. Brams* 60
Be Your Own Weather Forecaster ..... *George Laycock* 66
MI's $20,000 Highway Safety Contest! 74
Cover Story: The Car-Boat That Flies 84
These Birds Are Real Gone ..... *Lyman Gaylord* 100
How To Test Your Fishing Tackle ..... *Roy H. Martin* 104

TOM McCAHILL

Tests The Chevrolet 86
Tests The Chrysler 300B 90
Mail For McCahill 164

REGULAR FEATURES

MMI: He Solved A Thorny Problem.... *Jack B. Kemmerer* 56
Inventions Wanted! 59
People Who Do Things: They Dive For Oil 64
Pin-Up Car 94
It's New! 97
This Month's Bright Idea: 7-Way Saw Set 103

SHORT FEATURES

Fashion Goes Nuts 54
Weather Tips 70
How To Read The Clouds ..... *Eric Sloane* 72
Push-Button Climate 82
Automatic Driving Range 83
Push-Button Motorcycle 95
Backyard Space Ship 96

DEPARTMENTS

The Editor's Workbench 8
Invention Clinic 14
Dear Editor 18
Hot Rods And Custom Cars: The New Safety Rules 22
Conquest Of Space: Are The Russians Beating Us Into Space? 26
Speaking Of Jobs 43
Patents Granted 45
Science Shorties 47
Question Of The Month 178

(continued on page 6)

Cover: Painting by Gurney Miller

JUNE 1956

W. H. FAWCETT, JR. president
ROGER FAWCETT general manager
ROSCOE K. FAWCETT circulation director
GORDON FAWCETT secretary-treasurer
RALPH DAIGH editorial director
JAMES B. BOYNTON director of advertising
LEE WILSON production director
AL ALLARD art director
RALPH MATTISON associate art director

WILLIAM L. PARKER editor

ROBERT G. BEASON assistant editor

LAWRENCE SANDERS feature editor
J. ROBERT CONNOR news editor
HARVEY GARDNER science editor

ROBERT BRIGHTMAN crafts & hobbies editor
FRED HONIG associate editor
JOHN J. SMITH associate editor

AL HEIGHINGTON art editor
FRED COSPITO art associate
MARK BINN art associate
HARRY FASS art assistant
BILL FLEMING art assistant

HELEN E. SLOWIN production editor

Volume 52, Number 6

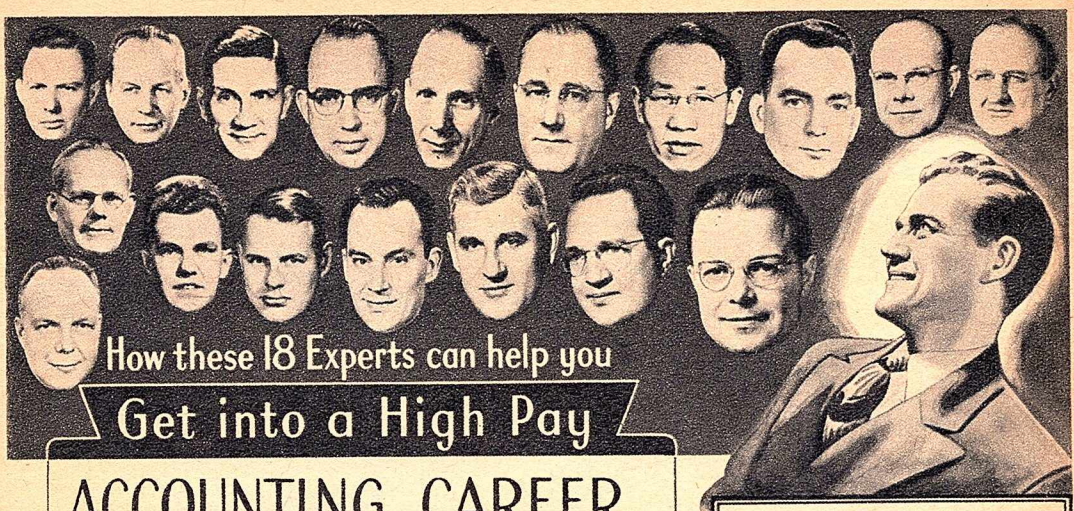
Permission hereby granted to quote from this issue of this magazine on radio or television, provided a total of not more than 1,000 words is quoted and credit is given to the title of the magazine and issue, as well as the statement, copyright 1956, by Fawcett Publications, Inc.

MECHANIX ILLUSTRATED is published monthly by Fawcett Publications, Inc., Fawcett Building, Fawcett Place, Greenwich, Conn. Editorial offices: 67 W. 44th St., New York 36, N. Y. Advertising manager: Garrett Livingston. Advertising offices: 67 W. 44th St., New York 36, N. Y.; 612 N. Michigan Ave., Chicago 11, Ill.; 672 S. Lafayette Park Place, Los Angeles 57, Cal.; 110 Sutter Street, San Francisco 4, Cal.; 1659 Guardian Bldg., Detroit 26, Mich. Entered as second class matter at the post office at Greenwich, Conn., under the act of March 3, 1879, with additional entry at Louisville, Ky. Printed in U. S. A. Title registered in the U. S. Patent Office.

Copyright 1956 by Fawcett Publications, Inc. Reprinting in whole or in part forbidden except by permission of the publishers.

Address manuscripts to New York editorial office. Unacceptable contributions will be returned if accompanied by sufficient first class postage. Not responsible for lost manuscripts or photos. All remittances and correspondence concerning subscriptions as well as notification of change of address should be addressed to MECHANIX ILLUSTRATED Circulation Dept., Fawcett Place, Greenwich, Conn. Price 25c a copy. Subscription price $3.00 per year in the U. S. and possessions and Canada. All other countries $6.00 per year. Foreign subscriptions and sales should be remitted by International Money Order in U. S. funds payable at Greenwich, Conn.

MEMBER AUDIT BUREAU OF CIRCULATIONS



How these 18 Experts can help you

Get into a High Pay ACCOUNTING CAREER

LaSalle's famous staff of Accounting authorities are helping thousands prepare for fast promotions and bigger pay. They can do the same for you!

If your heart is set on a larger income and all that it means . . . better home—fine car—larger bank account—more of the good things of life. . . .

If that's your ambition and you are really serious about it, then you owe it to yourself to get the REAL FACTS about LaSalle Accounting, and the many good-pay opportunities that can be YOURS through LaSalle's famous Problem Method plan.

It matters not whether you've had a single day of experience in this field—or whether you have already started but want to climb higher. LaSalle's expert training is designed to take you *from where you are . . . to where you want to be . . .* in higher positions and a lifetime career of security and good income.

WHY YOU CAN'T FAIL TO GAIN

You see on this page a panel of experts who know Accounting from A to Z . . . all the way from Basic Accounting, on up through Accounting Systems, Cost Accounting, Auditing, Income Tax, and training for the C.P.A. certificate. These are only part of our instruction staff. But what is most important to you . . .

. . . These C.P.A.'s and Expert Accountants know how to impart their knowledge to others . . . how to help you prepare quickly yet thoroly for success in this lucrative field.

The proof? What stronger proof could there be than that more than 4,200 Certified Public Accountants (one out of every 13 of the U.S. total) has trained with LaSalle? Or the hundreds of thousands of men and women whom LaSalle has helped qualify rapidly for more money, a brighter future, in a high-pay-lifetime career? These thousands came to us with different backgrounds of experience and varying degrees of ambition. Many have reported raises and promotions after only a few weeks of training. Thousands of them have written to say they are now earning 50% more—even *double* their former incomes—*often in less than a year.* These letters are published in book form for your inspection. They were written by real people, with real income, problems and ambitions—people who might be your next-door neighbor.

Yes, if you are really sincere in wanting to better your position—start your income climbing—enjoy a lifetime career of high standing and high reward—this friendly staff of experts can help you.

SAMPLE LESSON SENT FREE
MAIL COUPON BELOW

You don't have to wonder what LaSalle's Accounting plan is like. You will be sent a free sample lesson, which does not obligate you in any way. Study it—keep it—see for yourself how simple, clear, and easy it is to master. This is an actual lesson right out of the regular training—to show you exactly how LaSalle's Problem Method has trained more than 1,350,000 men and women from all walks of life.

Also . . . the latest book, "Accountancy, the Profession That Pays," gives all the latest facts about the new and growing opportunities in several different fields of profitable employment.

This can be an important day in your life. A coupon like the one below has started hundreds of thousands of men and women toward a bigger job, a larger income. It can do the same for you.

Member, National Home Study Council

Mail the Coupon Today!

FREE BOOK

LA SALLE
EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St., Dept. 6493H, Chicago 5, Ill.

Send free Sample Lesson in Accounting—also, latest free book, "Accountancy, the Profession That Pays" . . . all without cost or obligation.

Name.....*Age*.....

Address.....

City & Zone.....*State*.....

FREE SAMPLE LESSON

Now . . . anything you can see brought up 15 times closer!

from 1 to 50 miles

new, amazing

POWERHOUSE

EXTRA LONG RANGE

TELESCOPE

$12.95 VALUE

NOW 4.99

- Metal Draw Tubes!
- Extra Sharp!
- Deluxe Model!
- Converts into Microscope!

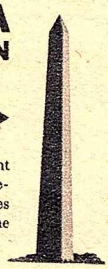
FREE PORTABLE TRIPOD

ENJOY THRILLING VIEWS OF PLANETS!

Spend endless hours of sheer enjoyment by observing the moon and other planets at far closer range! Educational too for children as well as adults! Yes! the POWERHOUSE TELESCOPE lets you and your family travel into outer space without leaving the earth!

225 TIMES AREA MAGNIFICATION

From this → ◯ to this →



These two dramatic photos of the Washington Monument prove beyond words the terrific power of this amazing telescope. The tiny photo is as the naked eye sees it miles from the nation's capital. The big picture is what the POWERHOUSE gives you—225 times the area!

POWERFUL LENSES REACH OUT INTO OUTER SPACE

Miles melt away. 15 miles become only one. Anything your eye can see—even celestial bodies—are brought closer. They look bigger, clearer, sharper. Observe the moon and its changing phases. Search the skies for the new man-made satellites being launched by the U.S. Navy. Try it on distant buildings, people, ships at sea, sports, airplanes, birds and wild animals—WITHOUT BEING SEEN.

BUY DIRECT & SAVE

Buy direct from importer! Reg. 12.95 value—yours for 4.99, with Table Tripod & dust protector. Send only 4.99 cash, m.o. or check for prompt delivery. (COD's plus postage extra.) Satisfaction GUARANTEED or your 4.99 back. Have fun! Have thrills! Order TODAY!

MADE IN GERMANY by 101 YEAR PLANT

This extra long range POWERHOUSE TELESCOPE was developed by a reputable German factory. Known for quality products for over 100 years. Not a toy with cardboard tubes! A real optical instrument with heavy-duty METAL draw tubes and PRECISION MADE lenses of amazing power. Every detail reflects German know-how and legendary workmanship.

7 SUPER FEATURES

1. Polished METAL tubes. 2. Smooth focusing. 3. Contoured eyepiece. 4. Interior coated objective lens as in expensive binoculars. 5. Permits viewing even in moonlight. 6. Deluxe quality finish thruout. 7. Converts quickly into a compound microscope! NOW the super power lenses give you greater range and magnification than famous American binoculars selling for up to $250.00.

THORESEN'S, Dept. 10-F-43

352 Fourth Ave., New York 10, N. Y.

MAIL TODAY

THORESEN'S, Dept. 10-F-43
352 Fourth Avenue, New York 10, N. Y.

RUSH ..... POWERHOUSE TELESCOPES and Free Tripod at cut price of 4.99 each, on 7 day trial, money back guarantee.

☐ Check, cash, or m.o. herewith. RUSH prepaid.
☐ Send C.O.D. plus postage fees.

Name .....

Address .....

Town..... State.....

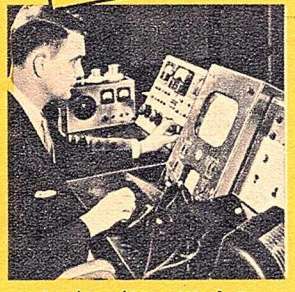
J. E. SMITH
President, National Radio Institute. 40 years' experience training men at home for Radio-TV.

I Will Send You A

SAMPLE LESSON FREE

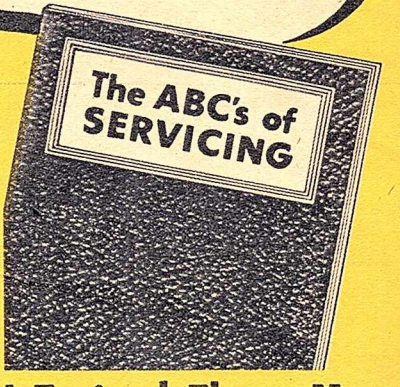
to show you how easy, practical it is to

Train at Home for Good Radio-Television Jobs



America's Fast Growing Industry Offers You Good Pay Plus a Bright Future

TRAINING plus OPPORTUNITY is the PERFECT combination for ambitious men. Let me send you a sample lesson from my course to prove you can keep your job while TRAINING at home in your spare time for better pay and a brighter future. I will also send my 64-page book to show you that Radio-Television is today's field of OPPORTUNITY for properly trained men.



Make $10, $15 a Week Extra

Many men I train fix neighbors' Radios, make extra money, soon after they enroll. Actual equipment you build gives you practical experience.

Television's Growth is Making More Jobs, Prosperity

Radio is bigger than ever and television is growing fast. Government, Aviation, Police, Ship, Microwave Relay, Two Way Communications for buses, taxis, railroads are other growing fields for Radio-Television trained men.

Mail Coupon—Find Out About This Tested Way to Better Pay

Take NRI training for as little as $5 a month. Many NRI graduates make more in two weeks than the total cost of my training. Mail coupon today for Actual Lesson and 64-page Book—Both FREE. J. E. SMITH, National Radio Institute, Dept. 6FC, Washington 9, D. C. Our 40th Year.

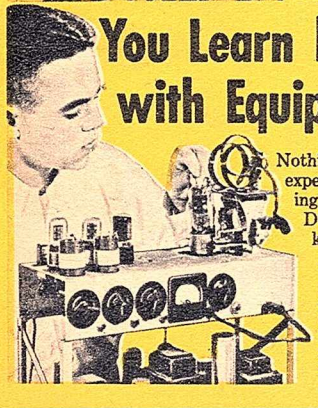
I Trained These Men

"I have a regular job as a police captain and also have a good spare time Radio and Television service business. Just opened my new showrooms and shop."—C. W. LEWIS, Pensacola, Florida.

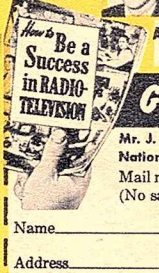
"I decided to quit my job and do TV work full time. I love my work and am doing all right. If fellows knew what a wonderful investment NRI is, they would not hesitate."—W. F. KLINE, Cincinnati, Ohio.

"Thanks to NRI, I operated a successful Radio repair shop. Then I got a job with WPAQ, later WBOB and now am an engineer for WHPE."—VAN W. WORKMAN, High Point, N. Carolina.

You Learn by Practicing with Equipment I Send



Nothing takes the place of practical experience. That's why NRI training is based on LEARNING BY DOING. My training includes kits of parts which you use to build equipment and get practical experience on circuits common to both Radio and Television. Shown at left is the low-power Broadcasting Transmitter you build as part of my Communications Course.



AVAILABLE TO **VETERANS** UNDER G.I. BILLS

Good for Both—FREE

Mr. J. E. Smith, President, Dept. 6FC
National Radio Institute, Washington 9, D.C.
Mail me Sample Lesson and 64-page Book, FREE. (No salesman will call. Please write plainly.)

Name_____ Age_____

Address_____

City_____ Zone____ State_____

VETS write in date of discharge_____

Approved Member, National Home Study Council

continued from page 2

SPECIAL FEATURES

Low-Cost Cooling For Your Home 106
Strike It Rich 132

SPECIAL GARDEN SECTION

Lawn And Garden Furniture 116
New Garden Products 124
Garden Tips 126

AUTOMOTIVE

Are You Driving A Dripper? 138

BOATING

Bonnie II (Part 2) 144

PHOTOGRAPHY

Monthly Photo Contest 150
Photography Today 152
Photo Wrinkles 154

DEPARTMENTS

Home And Shop Tips 114
Freddie Fumbles 114
Golden Hammer Award Winners 128
New Products 130
The Farmer's Page 137
Telescope Page (20-power Terrestrial Scope) 142

COMING NEXT MONTH

- **How to use the router**
- **How to build your own water skis**
- **How to make your own color prints**

plus many other exciting features, all in the July issue. Goes on sale June 21st.

New greaseless way to keep your hair neat all day

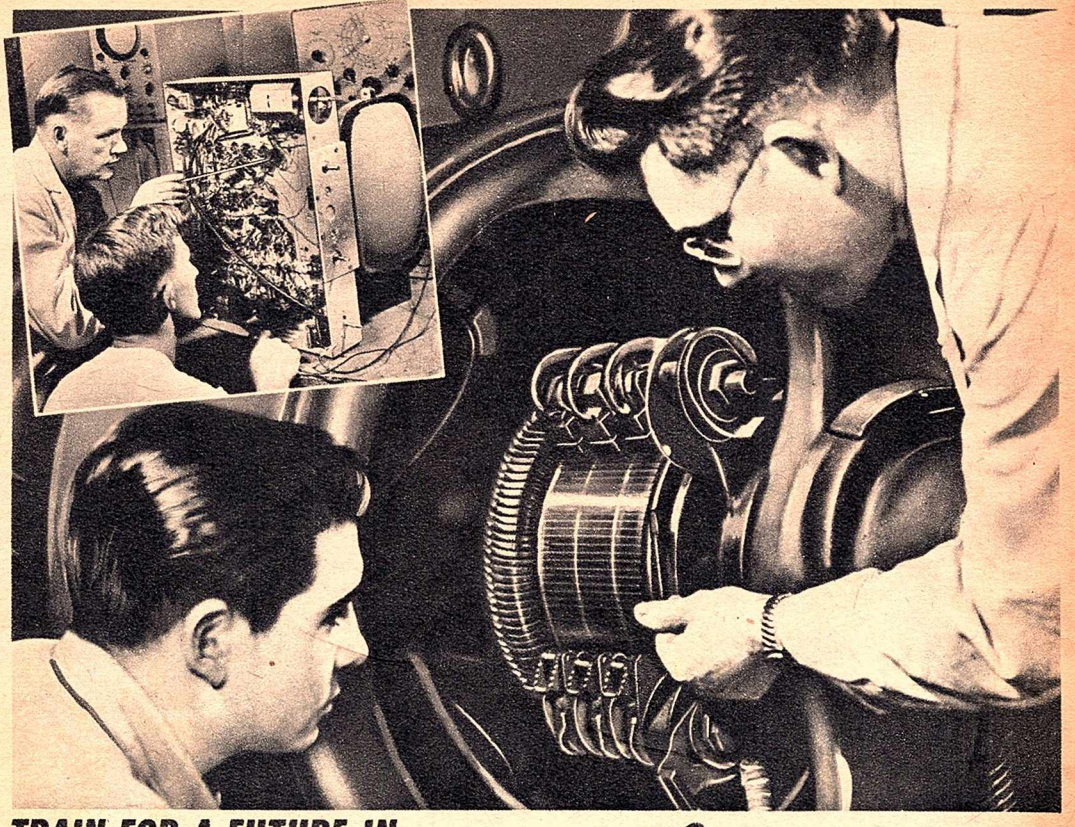
Prevents dry, unruly "panda hair"

New Vitalis keeps hair in place and prevents dryness with V-7, the *greaseless* grooming discovery.

You never have an overslick, plastered-down look. Try it. You'll *like* it.

New VITALIS® Hair Tonic with V-7®

ANOTHER FINE PRODUCT OF BRISTOL-MYERS



TRAIN FOR A FUTURE IN

Electricity or Television
-ELECTRONICS -RADIO-COLOR TV

IN GREAT SHOPS OF COYNE—
Largest, Oldest, Best Equipped
School Of Its Kind In The U.S.

Veterans and Non-Veterans

Whether 17 or up to 45 years of age, prepare for your future now. Don't be satisfied with a "No Future" job. Train the Coyne way for a better job *in a field that offers a world of opportunities in the years ahead.*

Training in REFRIGERATION and ELECTRICAL APPLIANCES can be included

WE TRAIN YOU IN CHICAGO

Learn the easier, practical way at *Coyne*, on real, full size equipment. No advanced education or previous experience needed. Lifetime employment service to graduates.

Train in the shops of Coyne—where thousands of successful men have trained for nearly sixty years—*Coyne is the oldest, best equipped school of its kind*—established in Chicago in 1899.

FINANCE PLAN Enroll now. You may pay most of tuition later. Part time employment help for students.

CLIP COUPON NOW for big new illustrated *Coyne* book. No obligation; *no salesman will call.* Get vital facts now!

Mail Coupon Today for

BIG FREE BOOK

"Guide to Careers in ELECTRICITY-ELECTRONICS and TELEVISION-RADIO"

B. W. COOKE, President **COYNE ELECTRICAL SCHOOL** FOUNDED 1899

A TECHNICAL TRADE INSTITUTE OPERATED NOT FOR PROFIT
500 S. PAULINA STREET, CHICAGO, Dept. A6-53H
ELECTRICITY ★ RADIO ★ TELEVISION ★ REFRIGERATION ★ ELECTRONICS

B. W. COOKE, President
COYNE ELECTRICAL SCHOOL
500 S. Paulina St., Chicago 12, Ill., Dept. A6-53H

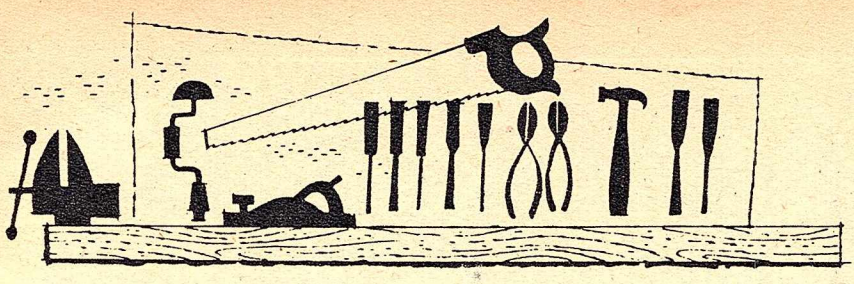
Send BIG FREE book and details of your training offer. This does not obligate me and no salesman will call. I am interested in:

☐ ELECTRICITY-ELECTRONICS
☐ TELEVISION-RADIO

Name.....

Address.....

City.....State.....



THE EDITOR'S WORKBENCH

● *This, That And The Other*

Those sly guys, the inventors, have not been lolling around on their reputations all winter, doing nothing. Fellow out in Los Angeles got tired of the smell of smoldering cigarettes in overflowing ashtrays. So he up and invented a self-cleaning ashtray with a built-in water pump that flushes away the dead and dying butts. Got a patent on the gadget, too. . . Also patented, by a gentleman from Pennsylvania, is a flashlight which costs so little you just throw it in the trash can when the batteries burn out. . .

All those heaps of dirty white snow piled on either side of the street got a San Franciscan to thinking of a better way to dispose of the stuff. So he invented a snow destroyer that one day may put the conventional plows and scrapers out of business. His machine scoops the snow right inside its body where streams of hot air melt it into water which later is dumped into the storm sewers. Cool idea, eh? . . .

But far more fascinating to me was the announcement that three scientists have come up with an apparatus which makes it possible, after all these years, to measure the sense of smell in a rat. Many's the night I've tossed and turned, worrying whether our little rodent friends could distinguish between the heady aroma of Chanel No. 5 and the garbage outside the door of Apartment 4B. I always thought they could . . . but now we can tell for sure, thanks to science. . .

And while we're on the subject of wild life, I have been informed on unimpeachable authority that pelicans are almost voiceless. Turtles, on the other hand, have peculiarly constructed ears which make it impossible for them to hear the highest notes of a lady soprano or of a violin, a flute or a piccolo. So you can stop wasting your time trying to be the only turtle-charmer in the world. . .

"He's got a sweet tooth" is an ancient expression which I have always thought was just a figure of speech. Well, as usual, I'm wrong. Now the boys in the laboratory have discovered that people with their own, original teeth can gauge the sweetness of various sweet foods more accurately than guys or dolls equipped with the store-bought or artificial kind of teeth. Glad I wasn't paying for the research. . .

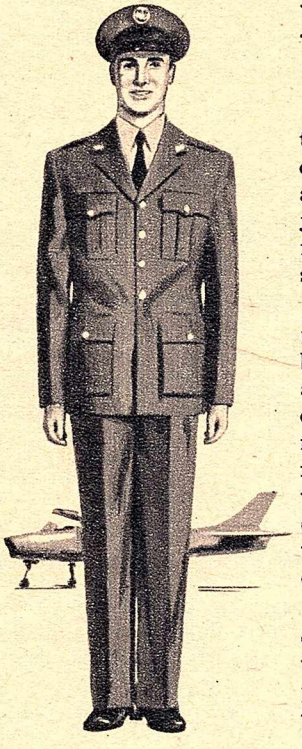
And speaking of research, just how tall was Goliath? The Old Testament says he stood six cubits and one span in height. In Biblical days a cubit was the distance from a man's elbow to the tip of his middle finger. A span was the distance from the tip of the thumb to the tip of the little finger when the hand was outstretched. Using my own frame for computing the measurements, I figure Goliath was nine feet nine inches tall, which would just about make him eligible for a hot basketball team today. . .

And speaking of hot, an ingenious gent in Knoxville, Tenn., has devised a method of measuring high temperatures—for instance, in furnaces where you can't use ordinary temperature indicators—by the employment of two identical compounds, one of which has been made radioactive. During the heating there is an exchange of radioactive and non-radioactive material between the two compounds. The extent of the exchange is proportional to the temperature. By measuring the radioactivity in the two compounds after they have cooled off, scientists can tell what the maximum temperature was in the furnace. . .

See you next month.—*Bill Parker* •

Men with mechanical skills:

measure yourself against this yardstick



Mechanics Creed

Upon my honor I swear that I shall hold in sacred trust the rights and privileges conferred upon me as a certified mechanic. Knowing full well that the safety and lives of others are dependent upon my skill and judgment, I shall never knowingly subject others to risks which I would not be willing to assume for myself, or for those dear to me.

In discharging this trust, I pledge myself never to undertake work or approve work which I believe to be beyond the limits of my knowledge; nor shall I allow any superior to persuade me to approve aircraft or equipment as airworthy against my better judgment; nor shall I permit my judgment to be influenced by money or other personal gain; nor shall I pass as airworthy aircraft or equipment about which I am in doubt, either as a result of direct inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily.

I realize the grave responsibility which is mine as a certified mechanic, to exercise my judgment on the airworthiness of aircraft and equipment. I, therefore, pledge unyielding adherence to these precepts for the advancement of aviation and for the dignity of my vocation.

This challenging creed has made the U. S. Air Force the finest technical service in the world. If you are a man who feels a deep sense of satisfaction from the knowledge of a job well done, the U. S. Air Force offers you a rewarding and exciting life. Skills you acquire in the Air Force will help you choose and succeed in your future career.

YOU GO PLACES FASTER ON THE ALL VOLUNTEER TEAM

THE U. S. AIR FORCE

Paste Coupon on Postcard M-45-MI2
and mail to

Airman Recruiting Information Branch
Box 2202
Wright-Patterson AFB, Ohio

Please send more information on my opportunities for enlisting in the U. S. Air Force. I am between the ages of 17-34 and reside in U. S. A. or possessions.

Name.....

Address..... Age.....

City..... Zone..... State.....

AUDELS Carpenters and Builders Guides 4 vols. $6

AUDELS CARPENTERS AND BUILDERS GUIDE 1
AUDELS CARPENTERS AND BUILDERS GUIDE 2
AUDELS CARPENTERS AND BUILDERS GUIDE 3
AUDELS CARPENTERS AND BUILDERS GUIDE 4
AUDELS CARPENTERS AND BUILDERS GUIDES ILLUSTRATED

Inside Trade Information for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—including new methods, ideas, solutions, plans, systems and money saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, simply fill in and mail FREE COUPON below.

Inside Trade Information On:

How to use the steel square—How to file and set saws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint.

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form, Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION. Send No Money, Nothing to pay Postman.

MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail $1 in 7 Days on each book or set ordered and further mail $1 monthly on each book or set until I have paid price, otherwise I will return them.

- ☐ AUTOMOBILE MECHANICS GUIDE, 1664 Pages. $4
- ☐ TRUCK & TRACTOR GUIDE, 1299 Pages . . . 4
- ☐ DIESEL ENGINE MANUAL, 575 Pages 2
- ☐ MACHINISTS HANDY BOOK, 1650 Pages . . . 4
- ☐ WELDERS GUIDE, 400 Pages 1
- ☐ BLUE PRINT READING, 416 Pages 2
- ☐ MATHEMATICS & CALCULATIONS, 700 Pages. 2
- ☐ SHEET METAL PATTERN LAYOUTS, 1100 Pages 4
- ☐ SHEET METAL WORKERS HANDY BOOK, 388 Pgs. 1
- ☐ MECHANICAL DRAWING GUIDE, 160 Pages . . 1
- ☐ MECHANICAL DRAWING & DESIGN, 480 Pages 2
- ☐ AIRCRAFT WORKER, 240 Pages 1
- ☐ TELEVISION SERVICE MANUAL, 434 Pages. . 2
- ☐ RADIOMANS GUIDE, 1040 Pages 4
- ☐ ELECTRONIC DEVICES, 216 Pages 2
- ☐ ELECTRIC MOTOR GUIDE, 1000 Pages 4
- ☐ WIRING DIAGRAMS (Light & Power), 272 Pgs. 1
- ☐ ELECTRICIANS EXAMINATIONS, 250 Pages. . 1
- ☐ ELECTRIC POWER CALCULATIONS, 425 Pages. 2
- ☐ HANDY BOOK OF ELECTRICITY, 1440 Pages. . 4
- ☐ ELECTRIC DICTIONARY, 9000 Terms 2
- ☐ ELECTRIC LIBRARY, 7000 Pages (12 Book Set) 18
- ☐ SHIPFITTERS HANDY BOOK, 250 Pages . . . 1
- ☐ REFRIGERATION & Air Conditioning, 1280 Pgs. 4
- ☐ MILLWRIGHTS & MECHANICS GUIDE, 1200 Pgs. 4
- ☐ POWER PLANT ENGINEERS GUIDE, 1500 Pages 4
- ☐ ENGINEERS & FIREMANS EXAMS, 525 Pages . 1
- ☐ PUMPS, Hydraulics & Air Compressors, 1658 Pgs. 4
- ☐ OPERATING ENGINEERS LIBRARY (3 Books) . 9
- ☐ MECHANICAL DICTIONARY, 950 Pages 4
- ☐ GARDENERS & GROWERS GUIDES (4 Book Set) 6
- ☐ CARPENTERS & BUILDERS GUIDES (4 Book Set) 6
- ☒ PLUMBERS & Steamfitters Guides (4 Book Set) 6
- ☐ MASONS AND BUILDERS GUIDES (4 Book Set) 6
- ☐ PAINTERS & DECORATORS MANUAL, 450 Pgs. 2
- ☐ HOUSE HEATING GUIDE, 1000 Pages 4
- ☐ OIL BURNER GUIDE, 384 Pages 1
- ☐ HOME APPLIANCE SERVICE GUIDE, 800 Pages 4

Check NOW!

You Can Look Over Any Guide In Your Own Home — Start the Easy Payments If Satisfied

MAIL THIS TODAY

Name _____

Address _____

Occupation _____

Employed by _____ M-6

YOUR OWN BUSINESS with BIG EARNINGS in..

ELECTRIC APPLIANCE REPAIRING

50,000,000 Families Are Your Prospects! Repair electrical appliances for friends and neighbors. Service electrical equipment in stores, etc. Earn up to $5.00-$6.00 an hour or more! New shop method home study training. Electronic Kit makes it now possible. Rush name for FREE Book, and Special PAY LATER form. **CHRISTY TRADES SCHOOL, 4804 N. Kedzie Ave., Dept. D-5406, Chicago 25.**

TASOPE PHOTO-ENGRAVING PLANTS

MATERIAL COST OF THIS CUT 2¼c SELLING PRICE $1.00 AND UP

Establish your own profitable PHOTO-ENGRAVING business. Make cuts for newspapers, printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for FREE catalog.

TASOPE, DEPT. MI-6, AURORA, MO.

ENGINEERING DEGREE IN 27 MONTHS

B.S. Degree. Aeronautical, Chemical, Civil, Electrical, Mechanical, and Electronic Engineering (inc. Radio & TV). Drafting 1-yr. Low rate. Earn board. Large industrial center. Students from 48 states, 21 countries. Demand for graduates. G.I. Govt. approved. Enter June, Sept., Dec., March. Catalog.

1066 E. Washington Boulevard
Ft. Wayne 2, Indiana

INDIANA TECHNICAL COLLEGE

OWN a Business

If employed, start part time. Alert dealers can gross $5 hourly profit on own service plus $3 on EACH serviceman. Clean, revive, mothproof rugs & upholstery on location. No shop needed. Services nationally advertised. Repeat customers. Easy to learn. We locally train and assist you. Quickly established. Easy terms. Send today for FREE booklet. No obligation.

DURACLEAN CO., 6-176 Duraclean Bldg., Deerfield, Ill.

Do FALSE TEETH Rock, Slide or Slip?

FASTEETH, an improved powder to be sprinkled on upper or lower plates, holds false teeth more firmly in place. Do not slide, slip or rock. No gummy, gooey, pasty taste or feeling. FASTEETH is alkaline (non-acid). Does not sour. Checks "plate odor" (denture breath). Get FASTEETH at any drug counter.

YOU BUILD 'EM—WE SELL 'EM EARN UP TO $50.00 A DAY AT HOME

Participate in our national sales and sub-contract plan—spare time—full time. You assemble special luggage and cases for photographers, musicians, salesmen, and all types of portables. We supply complete instructions—materials—tools—everything. No previous experience necessary. Free details. Abarsi Casecraft, Dept. HG, 807 W. Sunset Blvd., Los Angeles 12, Calif.

Secrets of VENTRILOQUISM Now Revealed!

Easy to learn in 60 to 90 days with our Home Study Course. **RESULTS GUARANTEED.** Make Money! Be Popular! Have Fun! Big Opportunity! Radio, Television, Stage Appearances! For Free Information regarding price and terms, WRITE. You must state your age. Dummy Catalog 25c.

FRED MAHER SCHOOL OF VENTRILOQUISM
Box 36, Studio MI-6, Kensington Station
Detroit 24, Michigan

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

63-F DISTRICT NATIONAL BUILDING

WASHINGTON 5, D. C.

GUNS

AUTHENTIC REPLICAS

Reproduced in Actual Size, Design and Balance. Made of Solid Cast Aluminum. Finished in Gun-metal Black.

START COLLECTING NOW!

- ☐ German P-38
- ☐ Colt Cobra .38
- ☐ German Luger
- ☐ German Mauser
- ☐ Spanish Moxley
- ☐ Russian Tokarev
- ☐ Italian Brevetaam
- ☐ Japanese Nambu
- ☐ Frontier .44 Colt
- ☐ Belgium Automatic
- ☐ Colt .45 Automatic
- ☐ Czechoslovakian Pistol
- ☐ S & W .38 Police Special

S & W .38 Police Special

3.00 EACH POSTPAID

Folder, 10c

Send Cash, Check or Money Order

LYTLE NOVELTY CO.
2656-Q6 Fashion Avenue
Long Beach 10, California

No COD's
No Canada Orders

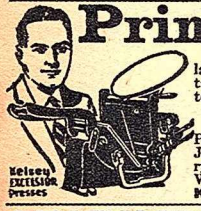
PEE WEE BATTERYLESS TUBELESS "LIFETIME" RADIO

REALLY WORKS—FOR YOUR LIFE Works WITHOUT TUBES, BATTERIES OR ELECTRICAL PLUG-INS. Never runs down. No burnouts. SMALLER THAN A PACK OF CIGARETTES! Fits in any pocket or purse. GUARANTEED TO RECEIVE LOCAL RADIO STATIONS ANYTIME—ANYWHERE YOU GO! Sensational new Ferrite Selective Tuner—Permanent Crystal diode, Super SPEAKER-PHONE. Durable black and gold plastic case.

SEND ONLY $2.00 (bill, ck, mo) and pay postman $4.99 COD postage on arrival or send $6.99 for postpaid delivery. SENT COMPLETE READY TO LISTEN WITH LIFETIME GUARANTEE AND FULL INSTRUCTIONS. Nothing extra to buy—ever. Available only from:

MIDWAY COMPANY Dept. WMI-6 KEARNEY, NEBR.

Print Your Own



Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too.

Own a Printing Business

Print for Others. Good Profit. Have home shop. Junior press $13; Senior $27 up. We supply everything. Easy rules. Pays for self in short time. Write for free catalog of outfits and all details.

KELSEY PRESSES, C-9 Meriden, Conn.

LEARN PLASTICS

COMPLETE LOW COST SHOP METHOD HOME TRAINING NOW AVAILABLE

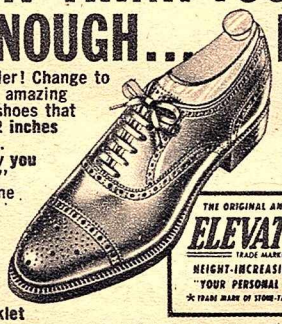
Get in on Big Money opportunities in Plastic molding, casting, forming, carving, etc. Earn as you learn with Interstate's professionally prepared course. All plastic materials furnished.

WRITE FOR FREE BOOKLET

INTERSTATE TRAINING SERVICE
DEPT. C-4, PORTLAND 13, OREGON

YOU MAY THINK YOU'RE TALL ENOUGH... BUT

It's easy to be taller! Change to "ELEVATORS", the amazing height-increasing shoes that make you **almost 2 inches taller** instantly . . . confidentially. Only you know "ELEVATORS" secret, but everyone notices the difference. So, don't just think you're tall enough; BE SURE! Wear "ELEVATORS"!



WHAT DO OTHERS THINK?

THE ORIGINAL AND GENUINE **ELEVATORS*** TRADE MARK®
HEIGHT-INCREASING SHOES
"YOUR PERSONAL PEDESTAL"
* TRADE MARK OF STONE-TARLOW CO., INC.

Write for free booklet
STONE-TARLOW CO., INC., Dept. MI-6-56, Brockton 68, Mass.

LAW FREE BOOK

THE LAW TRAINED MAN

Write today for a FREE copy of illustrated law book, "THE LAW-TRAINED MAN," which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 225 N. Michigan Ave.
Founded 1890 **Dept. 60-A, Chicago 1, Ill.**

DOLLARS for 18¢?

Yes, buy U. S. $1.00 values for 18¢ abroad. Get new, big profit mail order plan proved by 100,000 cash-in-advance orders shipped to buyers from overseas. You carry no stock. Full or part time—even from home. Export and travel abroad opportunities too, for men and women. Big profit plan with bargain import examples FREE. Write Mellinger Co., Dept. F266, 1717 Westwood, Los Angeles 24, Calif.

SHORTHAND IN 6 WEEKS

Famous SPEEDWRITING shorthand. 120 words per minute. No symbols; no machines; uses ABC's. Easiest to learn, write and transcribe. Low cost. 300,000 taught by mail. For business and Civil Service. Typing available. 33rd Year. Schools in over 400 cities. Write for FREE booklet to:

Speedwriting®
Dept. 1706-6
55 W. 42 St., N.Y., 36, N.Y.

EARN WHILE YOU LEARN

UPHOLSTERY
BE YOUR OWN BOSS

Practical, low-cost, LEARN-BY-DOING UTS Course, complete with tools, materials, frames, trains you quickly AT HOME, in spare time. Start making money in Upholstery almost at once! Big FREE illustrated book and FREE sample lesson show you how—give full facts about business, job opportunities for men and women. Write TODAY! Also Resident Training. Approved for Vets.

UPHOLSTERY TRADES SCHOOL
Dept. EH-1509 721 Broadway, New York 3, N. Y.

CAR COVER $6.95

Portable—Positive Protection against
RAIN—SUN—DUST—SCRATCHES

Heavy gauge plastic protects car finish. Goes on and off in a jiffy. Elastic Binding for extra security. Sold originally for $8.95—OUR PRICE $6.95 plus 35c pp. SUPER MODEL ORIG value $10.95—OUR PRICE $8.95 plus 45c pp., state Model and Year. Remit cash, check, M.O. or C.O.D. if preferred. MARDO SALES CORP., 480 Lexington Avenue, Dept. G-16, New York 17, New York.

MEN PAST 40

Troubled with GETTING UP NIGHTS, Pains in BACK, HIPS, LEGS, Tiredness Loss of Physical Vigor

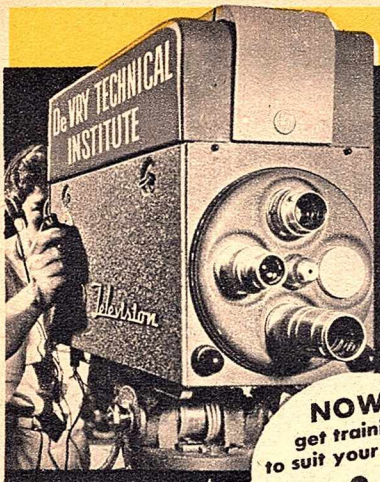
If you have these symptoms then your troubles may be traced to Glandular Dysfunction . . . a constitutional disease. Medicines that give temporary relief will not remove the cause of your trouble. Neglect of Glandular Dysfunction often leads to premature old age and sometimes incurable malignancy.

The past few years men from over 3,000 communities have been successfully treated here at the Excelsior Institute. They have found soothing relief and a new health and zest in life.

The Excelsior Institute, devoted to the treatment of diseases peculiar to older men by NON-SURGICAL methods has a NEW FREE BOOK that tells how Glandular Dysfunction may be corrected by proven NON-SURGICAL treatments. This book may prove of utmost importance in your life. Write today. There is no obligation.

Excelsior Institute, Dept. B-3931, Excelsior Springs, Mo.

NOW...from D T I's MILLION DOLLAR TRAINING CENTER



Learn to master TELEVISION AUTOMATION ELECTRONICS RADIO - ELECTRONICS by getting EVERYTHING YOU NEED!

NOW— get training to suit your NEEDS ● TAKE YOUR CHOICE

America's amazing multi-billion dollar Television field offers a chance of a lifetime to get started toward a good job or your own business. With over 400 TV stations in operation and more than 30 million receivers in use, Television is one of today's most promising fields. Mail coupon today. See how you may prepare to cash in on this grand opportunity.

Come to D T I's great CHICAGO LABORATORIES

...one of the Nation's FINEST!

Now, in the heart of the nation's TV Center, you can get all of your preparation in D T I's big, modern, wonderfully equipped training laboratories. Loads of commercial equipment and ample, well qualified instructors help you get a thorough, practical preparation in the SHORTEST POSSIBLE TIME. Part time student Employment assistance can help you pay your way while in training.

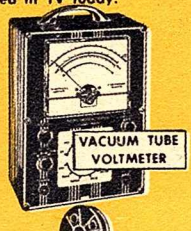
EMPLOYMENT SERVICE

As soon as you complete either the Chicago Laboratory or Home Training, you'll find D T I's grand Employment Service ready to help you start earning real money. Get full facts. Mail coupon today.

Get ALL of your training AT HOME!...*including setting up your own HOME LABORATORY*

ABOVE: You build and keep this big 5 INCH commercial-type oscilloscope — one of the most useful test units used in TV today.

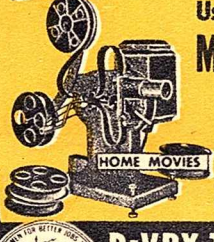
See how you may now get one of today's most complete, effective combinations of major home training aids — including (1) well illustrated lessons, (2) the wonderful aid of HOME TRAINING MOVIES and (3) 16 big shipments of electronic parts for setting up your own HOME LABORATORY. You work over 300 construction and test procedures to get the practical experience you need. This includes building and keeping a 5 INCH "SCOPE", Vacuum tube VOLTMETER, and a big 21 INCH TV SET. (D T I offers another home training in Television-Radio-Electronics, but without the TV set.) Mail coupon today for exciting facts.



Build and keep this BIG DTI Engineered TV set—easily converted to U.H.F. (DTI offers another home training, but without the TV set.)

89 WAYS TO EARN MONEY IN TELEVISION RADIO ELECTRONICS

MILITARY SERVICE: If subject to military service, the training information we have for you should prove very helpful. Mail coupon today.



Use 16 mm. MOVIES Only D T I provides you with the loan of visual training movies at home to help you master important basic points faster . . . easier . . . better!

"One of America's Foremost Electronics Training Centers"

ACT NOW! MAIL COUPON TODAY
Get this publication FREE!

MEMBER OF NATIONAL HOME STUDY COUNCIL

DeVRY TECHNICAL INSTITUTE
4141 BELMONT AVE., CHICAGO 41, ILL. DEPT. MI-6-M

I would like your Opportunity News Bulletin showing "89 Ways to Earn Money in Television-Radio-Electronics"; also, complete facts about the training opportunity made possible by your organization.

Name_____ Age_____
(PLEASE PRINT)

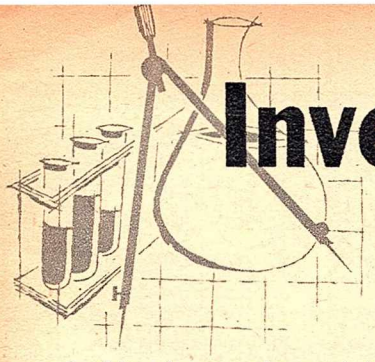
Address_____ Apt._____

City_____ Zone_____ State_____

D T I's Training is available in Canada 999

25 YEARS DeVry Technical Institute CHICAGO ILLINOIS

DeVRY TECHNICAL INSTITUTE
CHICAGO 41, ILLINOIS
FORMERLY
DeFOREST'S TRAINING, INC.



Invention Clinic

Joseph H. Kraus

In this column each month Mr. Kraus will answer as many letters as space permits on those subjects he feels to be of widest general interest. Time does not allow him to reply to any letters except those printed here. Address your questions to the Invention Clinic, *Mechanix Illustrated*, 67 West 44th St., New York 36, N. Y.

Tripod Panning Head

Ken Brooks of Sioux Falls, S. D., sends prints of his patent application for a tripod panning head which also controls the camera shutter. A refinement covers the mechanism as an integral part of the camera. He requests our comments.

This is an interesting development but we feel you can do much more with it. At present it is applicable to only one make of camera. Any change or modification in the camera design will render your construction worthless, so you will need to modify your panning head each time the manufacturer changes his product. Your method is also complicated. The same result can be obtained by a much more direct and simple mechanism which could be made to work with all cameras provided they can be attached to the tripod head. The cost of production would be much less than in your present design. Center your thoughts around the use of a flexible cable. And you could almost forget the camera refinement. We doubt you can sell this patent as it now stands.

Crystals

Richard Rose, Prince Coupe, British Columbia, Canada, says he has discovered a process for making very sensitive crystals for crystal radios. What is our opinion of this process?

You did not describe the process so we have no way of knowing if you have developed something new or if this is merely a rejuvenation scheme for old crystal.

We recommend that you make accurate scientific measurements of comparison between your crystals and commercial varieties. If results are favorable, have a search made to see if you can patent your system. Meanwhile exert every effort to improve your method. You may be on the verge of pioneering something new and worthwhile.

Hoops—Pocket Fan

William L. Tropf of Lakeland, Florida, wants to know if it is possible to return hoop-rolling to favor. He also proposes an electric fan with flexible blades and a self-contained battery for use at ball games, etc. What is our opinion of these two items?

You make no suggestions about how you propose to popularize hoop-rolling. You'll have to wrestle with that one.

A portable Tom Thumb Pocket Fan with rubber blades was manufactured by Rodorn of New York. Complete with flashlight battery, it sold for $1.98. The manufacturer has discontinued production, but still has all tools and dies and will be willing to negotiate with any organization which would like to produce and distribute the item. Patent number is 2,465,446.

Home Flour Mill

James R. Smith, Jr., of Corpus Christi, Texas, wants to share the idea of a home flour mill with folks who suffer from malnutrition. Why hasn't someone tried to invent and market such an item?

The chances are good that it will not sell for these reasons: The device is expensive, as is its operation. It cannot produce a pound of flour for the price you can purchase it already milled. Grain is not easily available. The best the home mill could produce is a poor substitute for the fine commercial product. Also we feel sure that the lady of the house with her nose and hair full of flour would be acting if she registered a smile of satisfaction over imagined better taste. Nor can we picture a smile on a man with white dust on his dark suit. But go right ahead with your experiments, and have fun.

Jewel Box Lid Control

Lewis Townsend of Detroit, Mich., applied

[*Continued on page* 16]

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • COPYRIGHTS • PATENTS

139-W VICTOR BUILDING, WASHINGTON 1, D. C.

Inventors

Sketch and describe your invention. Sign, date and have this disclosure witnessed by two people who understand your invention. Have us make a preliminary search among U. S. patents already granted for similar types of invention. We report on the probable patentability of your invention and recommend your further course of action.

Write for our instructive booklet, "Patent Protection for Inventors" and our convenient "Evidence of Invention" disclosure form.

VICTOR J. EVANS & CO. Merlin M. Evans
REGISTERED PATENT ATTORNEY
250-G MERLIN BUILDING, WASHINGTON 6, D. C.

INVENTORS

I shall be pleased to furnish you, upon request, with information relative to patent procedure—without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
923 Columbian Building, Washington 1, D. C.

PATENTS
C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
427 SNOW BUILDING, WASHINGTON 1, D. C.

INVENTORS
PROTECT YOUR INVENTION BY A U. S. PATENT. SEND FOR FREE "INVENTION RECORD" FORM AND "PATENT INFORMATION EVERY INVENTOR SHOULD HAVE"

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 35th FLOOR, 66B
NEW YORK CITY

Invention Clinic

[Continued from page 16]

for a patent on a push button control for jewel boxes. He states that a patent has been granted on a cover for a truck trailer which uses the identical principle but on a larger scale. Has he any chance of obtaining a patent?

The report which you received is an official confirmation of our own opinion. Neither miniatures nor the ultimate use to which the idea is put is a basis for a patent. But there are dozens of ways by which you can do the same job. If that is your main purpose, you could design another system to attain the goal you seek. We would not be impressed.

Lamp Socket, Plug Connector

Edward Terminello of Chelsea, Mass., sends diagrams and descriptions for a jiffy connection maker. What is our opinion?

This is a rather poor substitute for any of the many jiffy connecting sockets and plugs which are on the market. Your design responds to accidental flipping of the locking device. Most commercial jobs are reasonably safe on this score. We recommend that you examine the simplicity of present-day commercial articles.

Airplane Navigation Instruments

E. Schmid of Dorchester, Wis., says he has an idea which could be developed into an accurate altimeter, speedometer, and possibly other navigation instruments. But he is lacking the know-how, time and money. Where can he find someone who would be willing to develop this on a royalty basis? How can he learn if his idea is worth anything?

There is not much you can do with a thought as nebulous as this seems to be. Fundamentally, you want someone else to give his time, money, and brains to you. You

INVENTORS

Send for PATENT INFORMATION Book and INVENTOR'S RECORD without obligation

GUSTAVE MILLER
66-MI Warner Building
Washington 4, D.C.

REGISTERED PATENT ATTORNEY
ASSOCIATE EXAMINER
U. S. PAT. OFF. 1922-1929
Patent Attorney & Advisor
U. S. NAVY DEPT. 1930-1947
PATENT LAWYER

INVENTIONS WANTED

If you want to market, or sell, your invention for cash or royalties, Write for our Free Booklet. Send no drawings. We also welcome hearing from firms, or private capital, wishing to review inventions in any field. We will be glad to send notice of our clients inventions.

GLOBAL MARKETING SERVICE
2420 77th Avenue Dept. MD Oakland 5, Calif.

would cut him in on the profits if he is successful. To this you would contribute a thought which you "realize full well may not work." This isn't a good business proposition for anyone.

Automatic Drill Sharpeners

Nathan Feigenblatt, Jr., of Brooklyn, N. Y., asks about a device which would sharpen drills while they are rotating. He also sends a design for a drill stand in which drills may be sharpened.

It is impossible to shape drills properly by either of the methods you suggest. Once or twice you may be able to produce the proper angle for the lips, but you cannot get lip clearance. This calls for the heel line of the flute to be lower than the cutting lip line. There should be an angle of from 12 to 15 degrees across these points with relation to the body of the drill. We suggest that you examine a machinists' handbook, then start again. You have nothing of value now.

Gun Lock

Floyd F. Meyer, U. S. Naval Air Station, Atsugi, Japan, sends a design and description of a gun "lock" for use in sporting goods stores. It would allow for complete examination of the gun, yet prevent insertion of a shell into the firing chamber. What is our opinion?

This idea has little merit. Even though inexpensive (except for the tool needed for insertion and removal), the chances for sale are limited to a few gun makers. Direct sale to sporting goods stores is economically unsound. Your greatest problem might be in getting protection. This kind of construction is well-known, although it is used for entirely different purposes. There is no reason why a potential customer needs to try loaded shells in a gun. Empty shells would be satisfactory.

Diesel Electric Tractor

Charles H. Monroe of Jefferson City, Mo., sends a diagram and description of a Diesel-powered tractor with generator and motors. He points up some of the advantages. Is this patentable or would he need multiple patents?

So far as we can discover, your design offers nothing which is not found in Diesel buses or trucks. Placing the components on a farm tractor does not establish sufficient invention to assure a patent. And although this modification will eliminate some costly gears, it substitutes much more expensive generators, motor and controls. The high point is flexibility. You would need to develop many original designs to properly protect all possibilities, not merely transfer one group to another kind of vehicle.

[*Continued on page* 39]

NATIONAL SCHOOLS

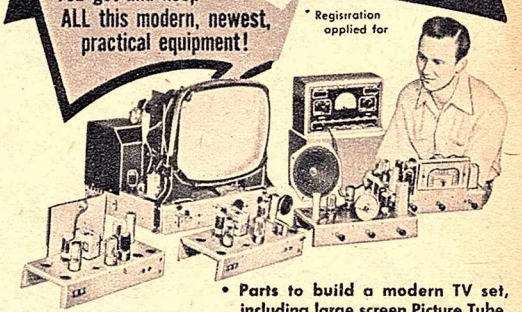
proudly presents

TELERAMA • ALL 8 BRANCHES OF **TELEVISION** ELECTRONICS • RADIO •

IN **ONE** DYNAMIC, MODERN SHOP METHOD, HOME TRAINING COURSE

You get and keep ALL this modern, newest, practical equipment!

* Registration applied for



YOU COVER ALL 8 BRANCHES IN ONE MASTER COURSE, ONE LOW TUITION

1. Television-including color TV
2. Radio — FM & AM
3. Industrial electronics
4. Sound recording and Hi-Fidelity
5. Preparation for FCC License
6. Automation
7. Radar & Sonar
8. Communications

- Parts to build a modern TV set, including large screen Picture Tube.
- Parts to build a powerful Superhet Receiver, standard broadcast and short wave.
- Parts to conduct many experiments and build — • Continuity Checker • RF Oscillator • TV Circuits • Audio Oscillator • TRF Receiver • Signal Generator
- Professional Multitester
- A MUST for all technicians

FOR MEN WHO WANT TO EARN MORE MONEY! Another great advance in Home Study Training. Let National Schools, of Los Angeles, a practical Technical Resident Trade School for over 50 years, train you at home by Shop-Method, for today's unlimited opportunities in ALL 8 BRANCHES of the Television, Electronics, Radio industry.

YOU DO MANY PRACTICAL JOBS — including servicing, circuit analysis. Build a modern TV set from ground up, with equipment kits we send you, including a new large-screen picture tube and professional Multitester, at no additional charge. You receive an experiment lesson with each kit.

EARN AS YOU LEARN. Many of our students earn their entire tuition and more in Spare Time jobs we show them how to do while learning. YOU GET GRADUATE ADVISORY SERVICE, TOO.

SEND FOR FREE FACT-BOOK AND FREE SAMPLE LESSON!
Mail coupon now to office nearest you.

NATIONAL SCHOOLS
4000 S. FIGUEROA ST., LOS ANGELES 37, CALIF.
187 N. LA SALLE ST., CHICAGO 1, ILL.
IN CANADA: 811 W. Hastings St., Vancouver, B. C.

NATIONAL SCHOOLS
TECHNICAL TRADE TRAINING SINCE 1905
Los Angeles, California

GET FAST SERVICE—MAIL NOW TO OFFICE NEAREST YOU!
NATIONAL SCHOOLS, DEPT. RA-66
4000 S. FIGUEROA ST. LOS ANGELES 37, CALIF. OR 187 N. LA SALLE ST. CHICAGO 1, ILL.

Rush free TV-Radio "Opportunity" Book and sample lesson. No salesman will call.

NAME _____ BIRTHDAY _____ 19__

ADDRESS _____

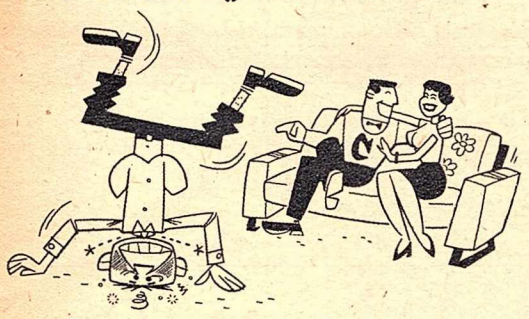
CITY _____ ZONE ____ STATE _____

VETERANS: Give Date of Discharge _____

Dear Editor—

Use this letters column as you see fit—make it a complaint box, question box, suggestion box or even a soap box. But use it! Our only requirement is that you sign your name and please keep 'em short and interesting. Address mail to: MECHANIX ILLUSTRATED, Letters Editor, 67 West 44th Street, New York 36, N. Y.

Headstrong



Those two soccer-playing guys in Eye-stoppers (April '56 MI) trying to build up their neck and back muscles by hanging weights from their heads are only wasting time. They would get better results if they stood on their heads for an hour each day. I know; that's how I built up my weak neck.

Bernard Gillman
Bennington, Vt.

How about necking?

June MI Mystery

Allen and Jerry are having a bicycle race. Jerry starts at the same time as Allen but from a point 100 feet ahead of him. Allen's speed is 21 mph, Jerry's 20 mph.

A horsefly starting with Allen and traveling at 25 mph, flits back and forth from Allen to Jerry during the race.

How far has the fly traveled when Allen is 100 feet ahead of Jerry?

Al Forbes
Noranda, Quebec
Canada

Weighty Problem

A couple of boys here at the factory were kicking this little problem around recently and it ended up in quite a hassle. Here it is:

A metal sphere houses a bird. Total weight of sphere, air inside it and bird is 50 pounds. Now, the bird takes off and flies around in the air inside the sphere. Will the total weight of sphere, air and bird become less when the bird is airborne, or will it remain at 50 pounds? Please advise.

Leo Chinowski
Moscow, Idaho

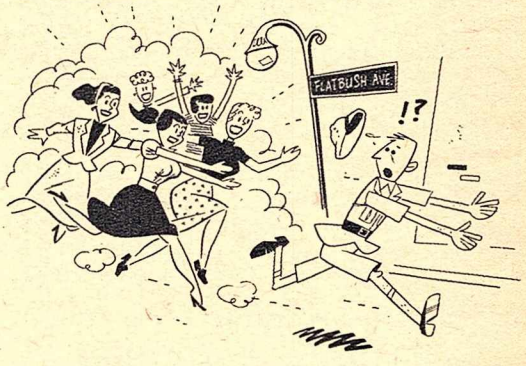
Listen, Leo, don't send us any more problems—we've wasted enough time arguing about this one. Any of you MI readers know the answer?

April Mystery Solved

The pigeon would have to unravel 1,995 feet of ribbon to cover the flagpole from top to bottom.

Gilbert Haines
Jacksonville, Fla.

Bunkum



I think all this stuff about women proposing in Leap Year is a lot of bunkum. I'm a bachelor with a fair amount of charm and money but I've yet to see a girl begging for my hand in marriage.

H. Schlotmann
Johannesburg, South Africa

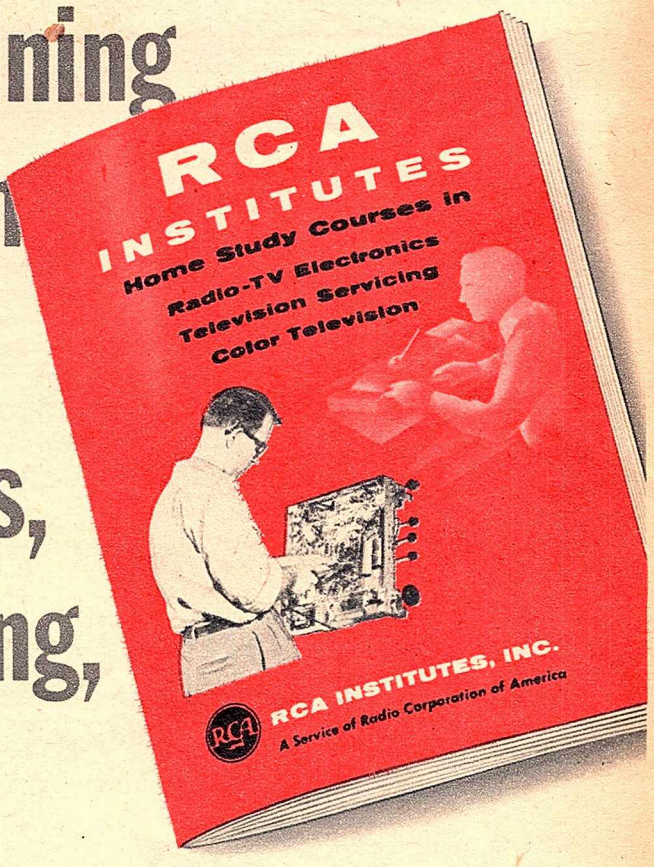
Been to Brooklyn lately?

Rocket Clubs

It may not be generally known to your readers but there are a large number of amateur societies which deal with the study of rockets. These societies give their members

[*Continued on page* 21]

RCA offers you the finest training at home in Radio-TV electronics, TV servicing, Color TV



SEND FOR THIS FREE BOOK NOW!

The instruction you receive and equipment you get (and keep) will start you on your way. Pay-as-you-learn. You pay for only one study group at a time. This 52 page book contains complete information on Home Study Courses for the beginner and the advanced student.

RCA Institutes, Inc., Home Study MI-66
350 West Fourth Street, New York 14, N. Y.
Without obligation, send me FREE CATALOG on Home Study Courses in Radio, Television and Color TV. No salesman will call.

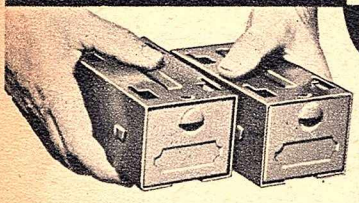
Name _____
Please Print
Address _____
City _____ Zone ____ State _____

IMPORTANT
Be sure to write for RCA Institutes catalog before signing up for any Radio-TV course

RCA INSTITUTES, INC.
A SERVICE OF RADIO CORPORATION of AMERICA
350 WEST FOURTH STREET, NEW YORK 14, N.Y.

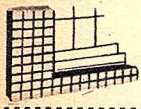
PERFECT for orderly SMALL PARTS STORAGE!

MULTI DRAWERS



LOW COST! INTERLOCK TO FORM CABINETS

Store easily lost, easily scrambled small parts in these sturdy, ALL STEEL parts drawers! Precision made, two-tone green enamel finish, card holder. SPECIAL PRICE—only $3.49 for package of 10, postpaid, standard size (5" x 2⅞" x 2¼"). Also Giant size (11½" long), fine for special tools, parts, etc., 6 for $6.49. Dividers available.



Unique key-slot system makes it easy to lock drawers at top, bottom, sides to form any shape cabinet, fit any space! NO framework required

Multi-Drawers, Dept. A C, 302 Madison, Covington, Ky.

Please send me.....sets of 10 std. size Multi-Drawers @ $3.49; and .....dividers @ 3c ea. Send me.....sets of 6 Giant size Multi-Drawers @ $6.49; and.....dividers @ 7c each. Enclosed is my (check) (MO) for $..... Sent postpaid in US (NO COD's), guaranteed. Giant and standard sizes NOT interchangeable.

Name.....

Address.....

.....

CABINET MAKING

LOW COST HOME TRAINING COURSE FOR BEGINNERS & ADVANCED CRAFTSMEN

Make money. Learn skills and secrets of fine woodworking and tool use. Professionally prepared shop method training tells and shows how. Covers everything. Easy to master.

Write for Free Booklet

INTERSTATE TRAINING SERVICE

DEPT. F4, PORTLAND 13, OREGON

LEARN MEAT CUTTING

Train quickly in 8 short weeks at Toledo for a bright future with security in the vital meat business. Big pay, full-time jobs—HAVE A PROFITABLE MARKET OF YOUR OWN! Pay after graduation. Diploma given. Job help. Thousands of successful graduates. Our 33rd year! Send NOW for big, new illustrated FREE catalog. No obligation. G. I. Approved.

NATIONAL SCHOOL OF MEAT CUTTING, Dept. 52-G, Toledo 4, Ohio

BUILD 16 RADIO

Reg. U. S. Pat. Off.

CIRCUITS AT HOME WITH THE NEW DE-LUXE 1956 PROGRESSIVE RADIO "EDU-KIT"

A PRACTICAL HOME RADIO COURSE ONLY $19.95

Learn practical electronics theory, construction, trouble-shooting. Build 16 Receiver, Transmitter, Signal Tracer, Code Oscillator, Signal Injector Circuits at home. Excellent background for TV. No knowledge of radio necessary "Edu-Kit" includes all radio parts, punched metal chassis, Printed Circuit materials, instruction manuals, electric soldering Iron, Tester, Tools, High-Fidelity Guide, TV Book, Quiz Book, Tester Instruction Manual, Membership in Radio-TV Club: Consultation Service, FCC Amateur License Training.

PROGRESSIVE "EDU-KITS" INC.
497 UNION AVE., ROOM 540-F, BROOKLYN 11, N. Y.

MAIL TODAY—ORDER SHIPPED SAME DAY RECEIVED

ORDER FROM AD—Receive FREE Bonus Resistor Kit Worth $5
30 DAY UNCONDITIONAL MONEY-BACK GUARANTEE

☐ I enclose full payment of $19.95 for "Edu-Kit" sent postpaid.
☐ I will pay postman $19.95 plus postage for "Edu-Kit" sent COD.
☐ Rush me FREE descriptive literature concerning "Edu-Kit."
Also send me FREE valuable Radio, TV, Hi-Fi literature.

NAME _____

ADDRESS _____

ROAD TO RICHES

You can be the next uranium millionaire! Government guarantees huge bonus! PRI instruments from $29.95. See your local dealer today! FREE CATALOG!

Write PRI, 4223ML W. Jefferson Los Angeles 16, California

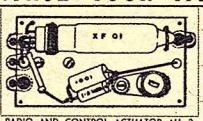
RADIO CONTROL YOUR MODEL

PLANES BOATS CARS

"CUSTOM MIDGET" RADIO ONLY $9.98

LICENSE FREE BAND

OPERATES SAME AS $50.00 SETS. INCLUDES LONG RANGE TRANSMITTER RADIO, RECEIVER RADIO AND CONTROL ACTUATOR ALL 3 EASY ASSEMBLY WITH OUR PARTS AND PLANS $9.98. PLANS ALONE $1.



DETAILED INFORMATION & RADIO CATALOGUE 25c

SPECIAL "SUPPLY SOURCE DIRECTORY" & $7.00 SUPPLY COUPON... $1.00

BOOK "RADIO CONTROL OF MODEL AIRCRAFT" CONTAINS 14 PLANS $3.98

RADIO CONTROL GARAGE DOOR DETAILS..... $1.00

RADIOMODELS BOX 36 DEPT. I BALTIMORE 6, MARYLAND

HYPNOTISM

Be Popular Amaze Entertain

Learn to apply Hypnotism and Autosuggestion in short time by training at home, with GUARANTEED RESULTS—DON'T DELAY. Write to America's oldest, most famous Hypnotism school for free information—now—today. Sent in plain wrapper.

SCHOOL OF APPLIED HYPNOLOGY

Dept. 636, 120 Central Park South, N. Y. 19, N. Y.

GOVERNMENT 40 ACRE

OIL LEASE $100

Act of Congress gives citizens equal rights with Oil Co's. to obtain Govt. leases. You do no drilling, yet may share in fortunes made from oil on public lands. (Payments if desired) Licensed & Bonded Oil Brokers. Free Information & Maps of booming areas. Write:

NORTH AMERICAN OIL SURVEYS
8272-B Sunset Blvd., Los Angeles 46, Calif.

NEW! 6" Chimney Fan

Just push into chimney or flue and rid kitchen, dark-room, laboratory or office of smoke, fumes, odors, heat. Handsome stainless steel grill. No cutting, fitting, fuss or bother. Fully guaranteed for 1 year. 110 v. AC, 60 cycles. Introductory price only $15.95 postpaid. Send Check or Money Order today.

Dealer Inquiries Invited

Fargo Electric Co. • 257-M Niagara St. • Buffalo 1, N. Y.

BUILD Outdoor or Indoor **BARBECUE** Fun for Family and Friends

No limit to design for garden, patio or kitchen. All metal unit serves as masonry form. Ends guessing! Efficient. For charcoal or wood. Durable. Units $24.95 up. See dealer or write.

MAJESTIC COMPANY, INC.
437 Erie Street
Huntington, Ind.

Do-it-Yourself Booklet — including designs and ideas. Send only 25c handling cost.

RUPTURED

BE *FREE* FROM TRUSS SLAVERY

NOW there is a new modern **Non-Surgical** treatment that permanently corrects rupture. These **Non-Surgical** treatments are so certain, that a Lifetime Certificate of Assurance is given. Write today for our New FREE Book that gives facts that may save you painful and expensive surgery, and tells **how non-surgically** you may again work, live, play and love and enjoy life in the manner you desire. There is no obligation. **Excelsior Hernia Clinic Dept. F2505, Excelsior Springs, Mo.**

Dear Editor

[*Continued from page* 18]

a chance to participate actively in theoretical study and to apply the results practically to the testing, instrumentation, guidance and firing of rockets.

MI readers interested in contacting or forming such a group may obtain information from Reaction Missile Research Society, Inc., c/o John H. Granger, Public Relations Director, Box 1199, State College, N. M.

Elbert G. Barrett
President, RMRS

● *Colt Makes Big Bang*

I wish to congratulate you and Mr. Robert Hertzberg for the fine story, The Gun That Refused To Die, which appeared in March '56 MI. Let's have some more stories about famous guns of the Old West.

John Schreiner
Hamburg, N. Y.

Keep your sights on MI, John. We have more on the way.

I was always under the impression that the original Peacemaker was a .44 Colt. It seems to me that I once read that the old .44 actually carried the name Peacemaker right on the barrel and that the .45 was erroneously labeled the Peacemaker.

Would it be possible to learn which is correct?

Robert Pfeifer
Portland, Ore.

The Peacemaker was made in all calibers from .22 to .45.

● *Gun Info Requested*

Recently I bought an old flintlock type double-barrel shotgun which has to be loaded through the barrel with a ramrod. On one side near one hammer is engraved "Clark." On the other side near the other hammer is engraved "London."

Could you or any of your readers tell me where this gun was made or during what period it was used?

Ralph Little
158 Brooklyn Street
North Adams, Mass.

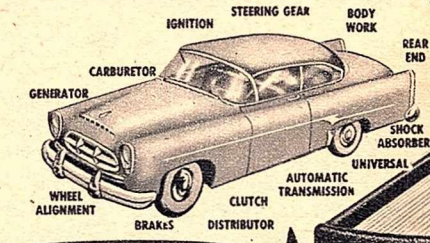
● *A-Dirigible*

Your idea for an atomic dirigible (Why Don't We Build An Atoms For Peace Dirigible? March '56 MI) is wonderful. Many peo-

[*Continued on page* 35]

HOW TO FIX ANY PART OF ANY CAR

QUICKLY--EASILY--RIGHT!



FREE 7-DAY TRIAL

WHETHER you're a beginner or an expert mechanic—now you can "breeze through" any "fix-it" job from simple carburetor adjustment to complete overhaul. Just look up job in index of MOTOR'S Brand-New 1956 Auto Repair Manual. Follow simple step-by-step directions, clear pictures. Presto—the job is done!

No guesswork! MOTOR'S MANUAL takes you from "scratch"—shows WHERE to start. WHAT tools to use. Covers EVERY job on EVERY car built *from 1946 thru 1956*!

Everything You Need to Know "Boiled Down" from 160 Official Shop Manuals

NEW, REVISED, ENLARGED, 1956 Edition contains the "meat" from over 160 OFFICIAL shop manuals—simplified for YOU. 23,436 essential repair specifications on over 737 chassis models. Over 1,000 big pages. More than 2,900 "this-is-how" pictures. 225,000 service and repair facts. Leads beginners every step of the way. Time-saving factory repair procedures for experts. Instructions and pictures so clear you CAN'T go wrong. Used by U. S. Army and Navy.

Try Book FREE 7 Days

SEND NO MONEY! Pay postman nothing. Make Manual show you what it's got. Unless you agree this is the greatest time and work saver you've ever seen—return book in 7 days and pay nothing. Mail coupon today to: MOTOR—Book Dept., Desk 3F, 250 W. 55th St., New York 19, N.Y.

Covers 737 Models

Buick	Imperial
Cadillac	Kaiser
Chevrolet	Lincoln
Chrysler	Mercury
Clipper	Nash
Continental	Oldsmobile
Crosley	Packard
De Soto	Plymouth
Dodge	Pontiac
Ford	Rambler
Frazer	Studebaker
Henry J	Willys
Hudson	Thunderbird

Same FREE Offer On MOTOR'S New Truck Repair Manual

Covers EVERY job on EVERY popular make gasoline and Diesel truck made from 1946 thru 1955. FREE 7-Day Trial. Check proper box in coupon.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MOTOR BOOK DEPT.
Desk 3F, 250 W. 55th St., New York 19, N. Y.

Rush to me at once (check box opposite book you want):

☐ **MOTOR'S** *New* **AUTO REPAIR MANUAL.** If O.K., I will remit $2 in 7 days. $2 monthly for 2 months and a final payment of 95c (plus 35c delivery charges) one month after that. Otherwise I will return the book postpaid in 7 days. *(Foreign price, remit $9 cash with order.)*

☐ **MOTOR'S** *New* **TRUCK REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. *(Foreign price, remit $10 cash with order.)*

Print Name_____ Age____

Address _____

City_____ State_____

☐ **Check box and save 35c delivery charge** by enclosing WITH coupon entire payment of $6.95 for Auto Repair Manual (or $8 for Truck Repair Manual). Same return-refund privilege.

The New Safety Rules

By Eugene Jaderquist

LAST year one of the best drags contenders in Southern California suddenly veered off the strip halfway through its run. Spectators, officials and the car's crewmen raced toward the car to see what was wrong. Nothing looked serious. The car came to a stop without turning over. But when the driver was pulled out he was so seriously burned he later died of his injuries.

Officials determined that the clutch-flywheel assembly had come apart under the force of the terrific acceleration. This was a stripped-down, bare-metal job and enough parts had flown around to rip through the exposed fuel line that ran low through the cockpit. A fire had started instantly. It wasn't a big one—none of the spectators had even seen the flames—but it was enough to make the cockpit like the inside of a furnace.

When a similar event occurs on the highway and perhaps a whole family is killed, everybody says that's too bad and you don't hear any more about it. No one thinks of changing state and local traffic safety ordinances, many of which fit the Model T Ford far better than they do present stock cars. But the hot rodders believe that safety rules should keep up with the machines. When an accident points out the need for new rules, they're written into the books.

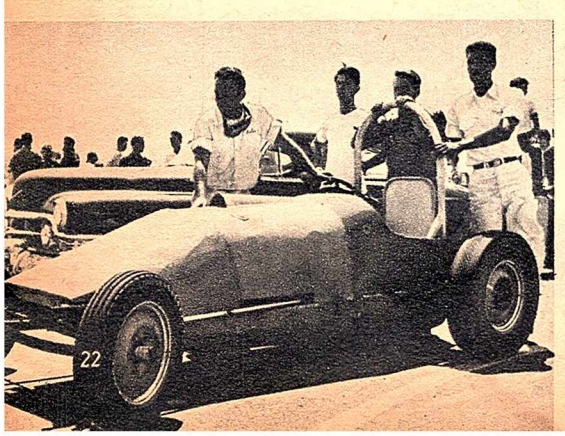
This is what happened after the tragic burnout described above. NHRA, and almost all other organizations which sanction or operate hot rod competition events, decreed that in the future all fuel lines must be shielded by steel; that the upper half of an exposed clutch-flywheel assembly must be similarly shielded.

Similarly, when there was a fatal accident at Bonneville last year, another safety rule was born. Technical examiners decided that the Bonneville fatality would not have occurred if the car's roll bar had been high enough to protect the driver's head. If you're a compact 5′ 10″ and the roll bar was designed for you, your 6′ 1″ friend cannot drive the car in sanctioned competition.

Sometimes all it takes is a good scare. At one California drag strip last year a flywheel came apart at the frightening speed of 7,000 rpm. The driver suffered no damage, thanks to the half-shield that protected the cockpit, but the bits and pieces of metal ricocheted downward to the asphalt and from there sprayed the crowd. Officials still wake up screaming when they think of the damage that could have been done if the shrapnel had gone through the crowd at belly level. For this coming season all cars in drags competition must have a shield that extends around the entire circumference of the flywheel-clutch assembly.

The list could be stretched, not because there have been a lot of rough accidents by those who participate in hot

Here's an example of a roll bar legal in height but with insufficient side braces.



rod competition—there haven't—but because responsible agencies and groups are always willing to adopt rules that will make the sport safer. They're also willing to be tough enough to enforce their rules without fear or favor. Not even the president of the club can get by with an inadequate firewall or worn tires.

Since rules do change so quickly and so positively, anyone in competition must keep up with them. NHRA, for example, has just completed the printing of the rules for the 1956 season. All NHRA-sanctioned strips must use NHRA safety rules in order to take advantage of the excellent low-rate insurance that goes with the sanction.

Greatest changes in the NHRA safety rules are:

1. The requirement for the complete flywheel-clutch cover. 2. Roll bars extending to the top of the driver's head rather than to the top of the cockpit. 3. Exhaust pipes must not point toward the ground, nor directly outward, but must extend back and away from the course. 4. Car must have a floor of metal or, where necessary, a metal subfloor under a plastic floor. 5. Hoods must be at least the width of the cowl, must combine with firewall to make a seal between cockpit and engine. 6. Fire extinguishers of the Pyrene type must be of at least one-gallon capacity, of the CO_2 type at least 2½ lbs. capacity. For the complete list of new rules, write NHRA, 5959 Hollywood Boulevard, Los Angeles 28, Calif.

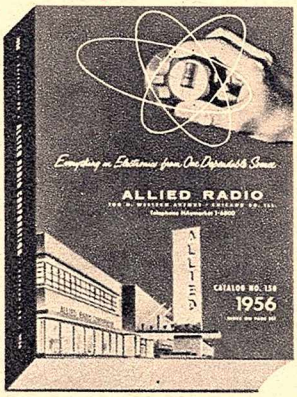
In the same letter you might ask for the list of classes for '56. You'll get them, all right, but you'll miss what has become the damndest controversy in hot rodding.

This centers around the stock classes and includes drags competition everywhere such classes are run. The stock classes are the most popular in drags competition. For privately-owned strips they're essential to the economic well-being of the owner; for non-profit strips they're the best guarantee of good attendance. At the same time they're the focus of virtually all the cheating in hot rodding.

The cheating is of a particular type. From the evidence it is apparent that hot rodders consider it completely ethical to use any trick in the book to hop-up an engine without being caught. Any trick, that

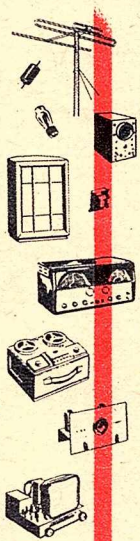
[*Continued on page* 25]

free! 1956 ALLIED ELECTRONIC SUPPLY CATALOG



324 value-packed pages

Save on Everything in TV and Radio Parts & Equipment



Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers & Hi-Fi Specialists

Send for ALLIED's big 324-page value-packed guide to *everything* in TV, Radio and Electronics! Select from the world's largest stocks of High Fidelity systems and components; recorders and phono equipment; TV tubes, antennas and accessories; Amateur station equipment and supplies; P.A. systems; test instruments; latest build-your-own kits; industrial electronic supplies—plus *everything* in electronic parts, tubes, transistors, tools and books. Save on everything in Electronics—send today for your FREE 1956 ALLIED Catalog.

Everything in Electronics From One Reliable Source

send for it FREE CATALOG

ALLIED RADIO

ALLIED RADIO CORP., Dept. 6-F-6
100 N. Western Ave., Chicago 80, Ill.

☐ Rush FREE 1956 ALLIED 324-Page Catalog

Name _____

Address _____

City _____ *Zone* _____ *State* _____

Shrinks Hemorrhoids New Way Without Surgery

Science Finds Healing Substance That Relieves Pain—Shrinks Hemorrhoids

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain — without surgery.

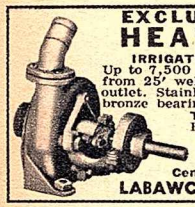
In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all — results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne*)—discovery of a world-famous research institute.

This substance is now available in *suppository* or *ointment form* under the name *Preparation H.** Ask for it at all drug counters—money back guarantee. *Reg. U. S. Pat. Off.

EXCLUSIVE DOUBLE-BEARING
HEAVY DUTY PUMPS



IRRIGATE • DRAIN • CIRCULATE • SPRAY

Up to 7,500 GPH; 1,000 GPH 60' high; or 3,000 GPH from 25' well. Use ¼ to 1 HP motor. 1¼" inlet; 1" outlet. Stainless shaft. **TYPE X**—2 oil-less bronze bearings. Won't rust **$10.95**

TYPE XB—Ball bearing model. Best for belt drives **$12.95**

Postpaid if cash with order. Don't delay—send for yours today!

MONEY BACK GUARANTEE

Centrifugal and Gear Pumps in All Sizes

LABAWCO PUMPS, Belle Mead 29, N. J.

TELEVISION NEEDS TRAINED MEN

Train AT HOME for a top-pay job or your own business. No experience needed. "Learn by doing" with 15 big radio-TV kits, including TV receiver. Licensed by N. Y. State; Approved for Veterans. Write for FREE BOOK & SAMPLE LESSON.

RADIO-TELEVISION TRAINING ASSOCIATION

Dept. I-6C 52 E. 19th St. New York 3, N. Y.

Watch Repairing Pays Big Money Learn at home

Watch repairers in great demand. Train step-by-step in 10 easy lessons. We furnish all tools and 15 jewel watch and practice movement. Turn spare time into cash. A licensed school. Low cost. Send for FREE book today.

ILLINOIS SCHOOL OF WATCH REPAIRING

2870 Elston Ave., Dept. MI-66, Chicago 18, Ill.

ENJOY NORMAL LIVING AGAIN—

If Ruptured

For lasting relief your rupture must BE HELD BACK FIRMLY DAY and NIGHT at work or play.

MILLER'S Entirely Different Consult Your Doctor!

Soft, flexible, fits neat as a glove. Saves Time, Money, Disappointment. Write for FREE booklet NOW!

FRED B. MILLER, Manufacturer

DRAWER 611M, HAGERSTOWN, MD.

BUILD YOUR OWN
AIR CONDITIONERS

From Junked Refrigerators for a Few Dollars

INSTRUCTION BOOKS SHOW YOU HOW..75c EACH

"HOW TO BUILD a Low Cost Air Conditioner"
"HOW TO BUILD an Automobile Air Conditioner"
"HOW TO BUILD a Low Cost Home Freezer"
"HOW TO BUILD an Electrostatic Precipitator"
"HOW TO BUILD a Low Cost Dehumidifier"

Complete "Install-It-Yourself" Air Conditioner kits for home and automobile, 2 Ton capacity, Brand New Parts—$124.40 and up.

Special Offer
2 Books—$1.00
3 Books—$1.50
or all 5 for $2.

FREE! Instructions and Literature on kits.

KOOL ENGINEERING CO., Dept. Y-6, 3716 Belmont, Chicago 18, Ill.

BUILD YOUR OWN **MIDGET ROADSTER $25** **BUILDS BODY & FRAME**

Build a **PONY ROADSTER** or **PICK-UP** in few spare hours. Uses 2 hp engine, 450 lb. loads, 70 m.p.gal. Great for kids, sturdy utility car. Designed for **VERY LOW COST** assembly from **PARTS BOUGHT IN YOUR NEIGHBORHOOD.** Use home tools. No welding needed on body or frame. **COMPLETE** step-by-step plans, 17 large size pages, 30 "show-how" photos, parts list, and hood-insignia. **ORDER NOW. ONLY $1.95** postpaid. Satisfied or money back.

PONY PLANS, DEPT. 56, 7641 TEXHOMA AVE., NORTHRIDGE, CALIF.

---

40 ACRE GOVERNMENT OIL LEASES—$100

You do no drilling, pay no taxes, may realize a king-size profit without ever leaving home. Free map and booklet. Write to

AMERICAN OIL SCOUTS, Dept. MI

7321 Beverly Blvd. Los Angeles 36, Calif.

GIANT STAMP ZOO FREE!

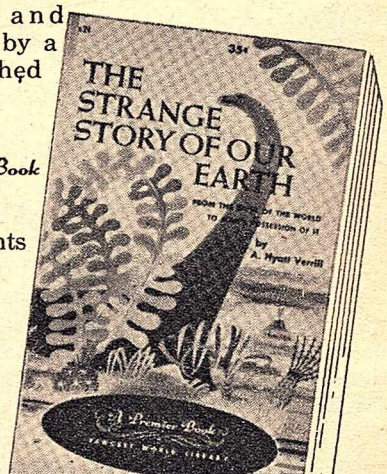
Snakes, Leopards, Rhinoceros, Zabu, Koalabear and other fierce jungle beasts, Approvals. Send 10c for handling. FREE STAMP MAGAZINE.

LINCOLN STAMP COMPANY,

St. Catharines 552, Ont., Canada

For a better understanding of our role on earth...

The vivid record of our heritage—from the birth of the world to man's possession of it... Written and illustrated by a distinguished scientist.



A Premier Book

only 35 cents

No. s24

FAWCETT WORLD LIBRARY

BUY THIS PREMIER BOOK FROM YOUR LOCAL NEWS DEALER

If your dealer is sold out, send only 35¢ plus 5¢ for postage and wrapping to PREMIER BOOKS, FAWCETT PUBLICATIONS, INC., GREENWICH, CONNECTICUT. Please order by number and title. Canadian orders cannot be accepted.

The New Safety Rules

[*Continued from page* 23]

is, except boring and stroking. These are considered the cowardly way out, since they add to the displacement. Anyone caught using special carburetor jets, a special cam or a milled head is considered smart but unfortunate; anyone caught with a big bore is beneath contempt.

Such fine distinctions are not made in the class rules. To the book, and the tech committee, a stock car is stock, period. Special valve springs disqualify you just as fast and just as completely as extra inches.

If violations of stock rules were rare, the big controversy would never have started. The fact is, however, that violations are quite common. Virtually every time a stock-class car is protested by a competitor, it is found to be non-stock. Where there are no protests, the suspicion is still strong.

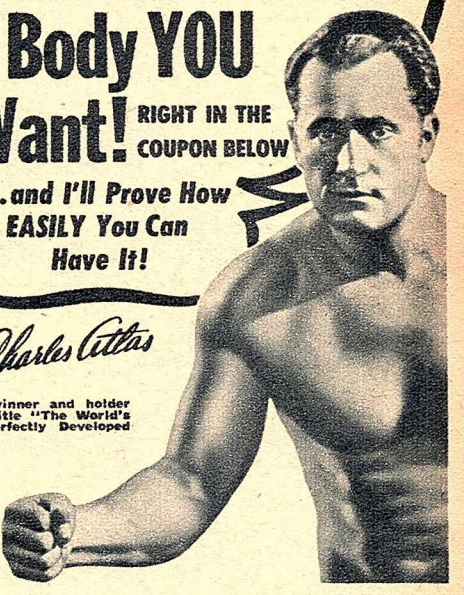
One fascinating sidelight of this controversy is that it costs more to run precisely stock and run well than it does to cheat. A new cam, a set of heavier springs, a slight amount of head milling are all simple, moderately expensive modifications. But when you run precisely stock the job is tremendous. You have to tear the entire engine down and bring all parts to perfect factory specifications. This is a job requiring superb workmanship and tremendous skill. The few car owners who can, and do, spend their time and money building one of these top-grade stock machines are understandably bitter when a hidden hop-up eliminates them at the drags in a supposedly stock class.

The most sensible solution to date is the elimination of the stock class in favor of what might be called a stock-appearing class. The cars would be classified by the ratios between their weights and the displacements of their engines. The only other rule would require them to look stock. No visible modifications would be permitted to either body or engine. Inside the engine the only restrictions would be against increasing the displacement.

Whatever is decided upon this year, it will be a test year. If you happen to have the wisdom of a Solomon, you might send your own solution of the problem to NHRA. They're ready to consider anything. •

Check the Kind of Body YOU Want! RIGHT IN THE COUPON BELOW

...and I'll Prove How EASILY You Can Have It!



Charles Atlas

Twice winner and holder of the title "The World's Most Perfectly Developed Man."

JUST tell me where you want it—and I'll add SOLID INCHES of powerful muscle SO FAST your friends will grow bug-eyed with wonder. I'll PROVE you can be a new man in just 15 minutes a day—in your own home—or it won't cost you a penny!

I myself used to be a 97-lb. weakling. Men called me "Skinny." Girls made fun of me. THEN I discovered my great new muscle-building system—"Dynamic Tension." It turned me into such a specimen of MANHOOD that today I hold the title "THE WORLD'S MOST PERFECTLY DEVELOPED MAN."

"Dynamic Tension" is the easy, NATURAL method you can practice in your own room—JUST 15 MINUTES A DAY—while your chest and shoulder muscles begin to swell . . . those arms and legs of yours bulge . . . and your whole body starts to feel "alive," full of zip and go!

FREE MY 32-Page Illustrated Book Just Mail the Coupon

Send NOW for my famous book "Everlasting Health and Strength." 32 pages, packed with photographs, valuable advice, answers many vital questions. This book is a real prize for any fellow. Yet I'll send you a copy absolutely FREE. Just glancing through it may change your life! Rush coupon to me personally: CHARLES ATLAS, Dept. 66, 115 East 23rd St., New York 10, N. Y.

CHARLES ATLAS, Dept. 66
115 East 23rd St., New York 10, N. Y.

Dear Charles Atlas: Here's the Kind of Body I want:

(Check as many as you like)

- ☐ More weight—Solid—in The Right Places
- ☐ Broader Chest and Shoulders
- ☐ Powerful Arms and Grip
- ☐ Slimmer Waist and Hips
- ☐ Strong Leg Muscles
- ☐ Better Sleep, More Energy

Send me absolutely FREE a copy of your famous book "Everlasting Health and Strength"—32 pages, crammed with photographs, answers to vital health questions, and valuable advice. I understand this book is mine to keep and sending for it does not obligate me in any way.

NAME_____ AGE_____
(please print or write plainly)

ADDRESS _____

CITY_____ STATE_____

Conquest of Space

Are the Russians Beating Us Into Space?

By G. Harry Stine
Viking-Aerobee Operations Engineer
White Sands Proving Ground

CLOSE on the heels of the White House announcement concerning the United States' unmanned satellite project, the Russians came out with the announcement that they would also put an "automatic cosmic laboratory" into orbit around the earth.

The date given by the White House for the launching of the first American satellite was 1957. The Russians say they will have one up in 1956!

Are the Russians really that far ahead of the United States in rocket research? Or are they merely bluffing to uphold their national prestige.

Part of the answer is revealed by talking with some of the ex-German rocket scientists at White Sands Proving Ground. They were first-hand witnesses to the break-up of German rocketry.

In 1945 both the Russians and the Western Allies were advancing rapidly into the collapsing Third Reich. The Germans' prime rocket center was at Peenemünde on the shores of the Baltic Sea. According to reports and the stories of the German rocket men in this country now, this center was evacuated when the Russians got close and a temporary headquarters was set up near Nordhausen in the Hartz Mountains. Nordhausen was the big underground assembly plant for the huge V-2 rockets and was finally overrun by American troops. Peenemunde was taken by the Russians. But they were not the only rocket research centers in Germany; the Germans literally had them everywhere, for there were 12 different guided missiles in the final stages of development in Nazi Germany in 1945, although at one time the Germans were working on 48 different missiles!

Nordhausen was in the territory to be occupied by the Russians, so the Allies stripped the Nordhausen factory, taking anything and everything that even looked like a rocket part. A few days later the Russians moved in and took it over.

The United States got about 100 V-2 rockets, most of the research scientists and engineers who had built the giant rocket and a great number of technical papers and blueprints.

But the Russians got Peenemünde, Nordhausen, nearly 200 V-2's, all the production facilities that had not been stripped, and about twice as many German rocket men as we did. Most of these men were production people rather than scientists.

We brought the scientists to this country with the V-2's. They showed us how to fire them, then got to work on new missiles such as the Army's Redstone. We shot up our V-2's in upper atmosphere research and concentrated on building newer and more advanced rockets. It was almost a matter of starting from scratch since the United States had only a limited amount of technical knowledge in spite of the fact that Goddard and the ARS had originally developed nearly 90 per cent of the principles right here!

The Russians learned to fire V-2's, too. And they had the production facilities and production men. In 1950 George Sutton of North American Aviation, Inc., reported that the Germans had put the V-2 rocket back into production. According to the magazine Aviation Week, the Russians had given it to the Red Army troops by 1948 as an operational weapon.

[*Continued on page* 29]

NEW RUBBER STAMP BUSINESS PAYS BEGINNERS UP TO $9.20 AN HR.

START AT HOME IN SPARE TIME with Table Top Machine!

The multi-milliondollar Rubber Stamp business—once controlled by a few big companies—is now being taken over by small operators—one in each community throughout the United States. Men and Women who have this inexpensive machine can turn out huge quantities of Rubber Stamps with special wording that buyers once were forced to buy from big cities. Material costing only 27c makes a stamp that sells for $1.80. The machine that does the work is simple and easy to operate and it turns out as many as six Rubber Stamps at a time, each with different wording such as names, addresses, notices, stock numbers, prices and other "copy" needed by offices, factories and individuals. Working full capacity, it can earn as much as **$9.20 an hour for the operator!** Now you can get into the big-pay business yourself, with your own home as headquarters. You don't need experience. We supply everything, including complete instructions and eight ways to get business coming in fast. Start making up to $9.20 an hour from the very beginning. Cash in on the profitable Rubber Stamp business in your community, right away. We'll mail full particulars FREE and no salesman will call. Be first in your locality. Rush coupon today or send your name on postcard to

RUBBER STAMP DIV., Dept. R-46
1512 JARVIS AVENUE • CHICAGO 26, ILLINOIS

RUBBER STAMP DIV.
1512 Jarvis Ave., Dept. R-46
Chicago 26, Illinois

FREE!

Please rush full particulars about the little machine that can get me started in the profitable Rubber Stamp business at home in spare time. Everything you send me is FREE and no salesman will call.

NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

TRAIN

Your VOICE!

RESULTS GUARANTEED

STRENGTHEN your voice this tested, *scientific* way. Yes—you may now be able to develop the POWER of your speaking and singing voice in the privacy of your own room. Self-training lessons, mostly silent; no music required. Write TODAY for Eugene Feuchtinger's great booklet "How to Strengthen Your Voice." It's absolutely FREE. You must state your age. Booklet mailed in plain wrapper. No salesman will call. Send your name and age RIGHT NOW!

Prefect Voice Institute, 210 S. Clinton St., Studio FU-3, Chicago 6, Ill.

---

send for FREE BOOKLET

LEARN LOCKSMITHING!

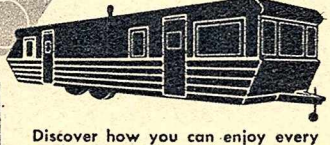
Learn this fascinating, profitable trade from experts in your spare time at home!

Age or physical handicap no disadvantage. Year around, steady income. Full or part time. Practical, illustrated lessons. You can make money even while learning! All materials and special tools supplied without extra charge.

LOCK INSTITUTE, Dept. M-77
15 Park Avenue Rutherford, N.J.
Lic. by N. J. State Board of Education
Approved for Veterans

Subscribe to . . . Trailer Topics Magazine

6-Month Trial Subscription $1



Discover how you can enjoy every modern convenience in your own home for just pennies a day. Read the true-life stories of those who live in mobilehomes and love it.

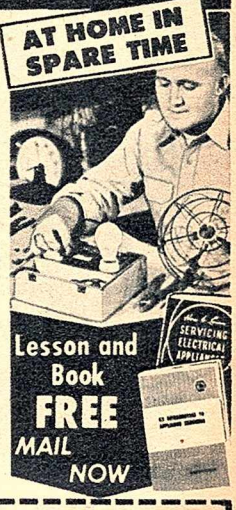
Only $3.00 for 2 years.

. . . . . **. . . TRAILER TOPICS MAGAZINE**

Room 1594 **28 East Jackson Blvd., Chicago 4, Illinois**

Step Up Your Pay — Learn to Fix APPLIANCES

ACT NOW-Fast Growing Field Needs More Electric Appliance Technicians



Electrical appliance repair offers you good pay, SECURITY. Every wired home today averages 8 electrical appliances. Up to 10 million new appliances are sold every year. Owners pay well to keep them in repair. That means a fast growing need for trained men.

Learn with Tester You Build

Our training includes the parts to build a multi-use appliance tester that helps you find electrical defects easily. It equips you to do professional trouble-shooting; helps you start making money soon after you enroll.

Earn $3, $4, $5 Hour Spare Time

Fix toasters, irons, fans, etc. for friends and neighbors in spare time. Jobs done in basement or spare room can earn you $3 to $5 an hour. Mail coupon today.

National Radio Institute, Dept. CF6, Washington 9, D. C.

Please send me Electrical Appliance Training lesson and book free. (No salesman will call.)

Name..... Age.....

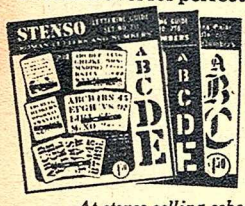
Address .....

City..... Zone.... State.....

PERFECT LETTERING
Quick-Easy-Inexpensive with STENSO Lettering Guides

FOR EVERY SIGN-MAKING NEED

Easy as writing your name, with STENSO Lettering Guides of sturdy treated stencil board. Use over and over for perfect lettering. **Money-Back Guarantee**



GOTHIC No. 210... ½-¾-1-1¼-and 1¾ inch letters and numbers (10 stencils) . . **$1.50**

ROMAN No. 211 . . . ½-¾-1-1½-and 2 inch letters and numbers (10 stencils) . . **$1.50**

Old English No. 212 . . . 1-1¾ and 2½ inch letters and numbers (7 stencils) . . **$1.50**

At stores selling school supplies, stationery, art materials, hobbies, or order below from...

STENSO LETTERING CO. Dept. 36
1101 E. 25th St., Baltimore 18, Md.
Please send me:
_____Set #210-$1.50 _____Set #211-$1.50 _____Set #212-$1.50
LARGE SIZE STENSO LETTERING GUIDES
_____#93—3 inch letters, numbers, $1.00 _____#96—6 inch letters, numbers, $3.25
_____#94—4 inch letters, numbers, $1.75 _____#98—8 inch letters only, $4.00
_____#95—5 inch letters, numbers, $2.50 _____#99—8 inch numbers only, $1.75
Name_____
Address_____
City_____Zone_____State_____
NO C. O. D.'S PLEASE!

Own and Play the ACCORDION
for fun...for popularity...for profit!

SAVE UP TO 50% on famous ITALIAN MAKES

Buy direct at amazing savings from America's biggest importer of fine Italian made accordions. **5 DAY FREE TRIAL!** Easy Terms. Free Lessons—Easy to learn. Personalized selection service. Trade-ins accepted. Write today for big Color Catalog and our low wholesale prices. FREE!

5 DAY FREE TRIAL

Accordion Manufacturers & Wholesalers Outlet
2003 West Chicago Avenue - Dept. MX-66 - Chicago 22, Illinois

AIRWAY COMPASS fits all autos boats, planes

SELF-LIGHTED, INSTANTLY INSTALLED
no wires to hook up — no holes to drill

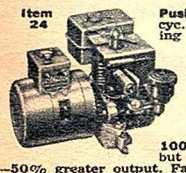
Same guaranteed performance that won Sherrill Compasses the ARMY-NAVY award for dependable service all over the world. 7 pastel colors—blue, green, white, gray, yellow, tan, coral. Complete, only $3.98.

At dealers, or write SHERRILL PRODUCTS CO., MEXICO, IND.

BUY DIRECT FROM-FACTORY → SAVE MIDDLEMAN PROFITS

MASTER MECHANIC PORTABLE LIGHT PLANTS

Item 24



Push Button Start—600-700 watts—115 v. 60 cyc. AC. Powered by a rugged 2 hp. easy starting Briggs gas engine. No wiring necessary, just plug in and operate. Plenty of current for any radio, television, oil burner, freezer, pump, lights, etc. which require up to 700 watts. Ideal for camp, cottage, trailer or boat! Includes voltmeter and built-in winding to charge 6 v. auto batteries. Wt. 75 lbs. Easily fits in car trunk. Be prepared if storm knocks out power lines. Reg. $275.00 **$143.50**

1000-1200 Watt Plant (Item 45) same as Item 24 but with larger generator and engine **$199.50**
—50% greater output. Factory Special

Send 10c for big 1956 Catalog. Free with order. Prices f.o.b. factory. 10 Day Money Back Guarantee. Send Check or Money Order.

MASTER MECHANIC MFG. CO., Dept. 61-M, Burlington, Wis.

NEW, IMPROVED CALCULATOR FOR WOODWORKERS only 25c

Instantly gives information on lumber, nails, concrete mixes, painting materials, etc. Convenient, simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of woods. 6" diameter heavily varnished cardboard. Send 25c, no stamps, please to Greenlee Tool Co., 2346 Columbia Avenue, Rockford, Illinois.

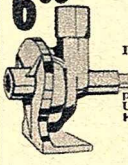
KADET 4-WHEEL TRACTOR
LOW IN COST-HIGH IN QUALITY

Tillers, Mowers, Tractors low as **79.50**

This tractor is ideal for Farms, Estates, Schools, Nurseries, Parks, etc. 12 quick-hitch attachments available, including Snow Plow, Sickle Mower, Trailer, Turning Plow, etc.

FREE catalog write Dept. 23

NATIONAL FARM EQUIPMENT CO., INC.
142 GREENE STREET • NEW YORK 12, N. Y.



6.95

FREE WIN A TRACTOR WRITE FOR ENTRY BLANK NOTHING TO BUY **FREE**

HEAVY OILIPH-BALL BEARINGS PUMPS MILLIONS OF GALS.

IRRIGATE, SPRAY, DRAIN OR FILL ANYTHING—ANYWHERE! Will not Rust-Clog or Leak. Patented Seal. Pumps 2800 gph, 420 gph at 75' high or 1600 gph from 25' well. Six blade impeller. Threaded for pipe, ¾ inlet, ½ outlet. Use ⅛ to ¾ hp motor . . . **7500 gph 9.95**
Heavier 2800 gph 8.95 **Heavier 11.95**
Check, MO or COD—Money Back Guarantee
FREE Literature—Comparison Charts

U. A. T. ENG. CO. HICKSVILLE 273, NEW YORK

Old Wall Telephones

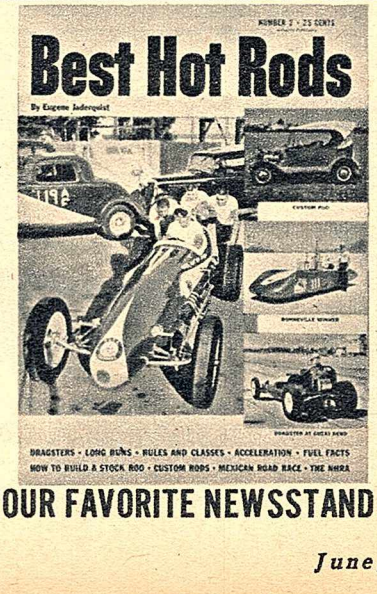
WORKING ORDER
OAK CABINETS
HAND CRANK FOR RINGING

$5.00 EACH F.O.B.
TELEPHONE CO., Turtle Lake, Wis.

FREE BOOK

ON RUPTURE CARE
Contains much helpful information. Shows how thousands have been helped by the comfortable, safe WEB Truss. Write today to:

WEB TRUSS CO. Dept. MI-6, HAGERSTOWN, MD.


NUMBER 2 • 25 CENTS
Best Hot Rods
By Eugene Jaderequist
DRAGSTERS • LONG RUNS • RULES AND CLASSES • ACCELERATION • FUEL FACTS
HOW TO BUILD A STOCK ROD • CUSTOM RODS • MEXICAN ROAD RACE • THE NHRA

AT YOUR FAVORITE NEWSSTAND 25c

Conquest Of Space

[*Continued from page* 26]

This story is pretty well backed up by the tales told by the Germans who came to this country. A lot of their friends had been taken by the Russians and they never heard from some of them again. But a short while ago a very significant development took place: a German at White Sands—he's now a naturalized U. S. citizen—got a letter from one of his friends who had vanished back in 1945 behind the Iron Curtain. While the letter told nothing, the man was back in Germany again. It was somewhat of an indication that the Russians might have picked the brains of the German rocket men and are now proceeding on their own!

By 1953 rumors began reaching this country saying that the Russians had made real improvements on the V-2. They were getting ranges of 500 miles with accuracies of plus-or-minus 2,000 feet at that range. This might seem to be a little fantastic, but the Germans actually achieved an accuracy of about plus-or-minus 2,000 feet at 230 miles range with the V-2 in early 1945.

There were also stories about a super-powerful Russian rocket motor, the Model 103, supposedly capable of 460,000-pounds of thrust and burning kerosene and liquid oxygen. This may well be a development of the V-2 motor for this was the propellant combination the Germans would have liked. But kerosene and gasoline were not available due to the general shortage of petroleum products in the Third Reich.

Recent reports state that the Russians claim to have fired single-stage rockets to 250 miles altitude. They even claim to have made mammal flights with monkeys and mice to 150 miles with successful recoveries.

There is no way of checking some of these reports. Some may be wild rumors, others exaggerated news releases. Our intelligence agencies undoubtedly know more, but they aren't talking.

But, in spite of these stories, and in spite of the fact that the majority of the information on America's rocket program is classified, the author is extremely doubtful that the Russians are ahead of us . . . right now.

One particular faction among American

[*Continued on page* 33]

DRAFTSMEN

CASH BIG PAY CHECKS!

Train Now for more success, greater security

LEARN AT HOME IN SPARE TIME
(or at college in Chicago)

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed. Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION — MAIL COUPON TODAY!
Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

CHICAGO TECHNICAL COLLEGE

G-280 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois

Mail me FREE lesson with facts about big opportunities in DRAFTING.

Name..... Age.....

Address .....

City..... Zone..... State.....

If You Can Light a Match...You Can MAKE UP TO $1,000.00 AND MORE IN A MONTH

Amazing...New...Super Sensitive

MERLITE FIRE ALARM HOWLS 1/5 MILE WARNING When You Hold a Lighted Match Near It

Make sensational 3-second "Lighted Match" Demonstration, pocket biggest earnings of your life, full time or spare time! Simple test proves new Merlite Fire Alarm so sensitive to fire, a lighted match "triggers" the unmistakable irritating "howl," audible ⅕ mile away! No installation, no connection to house current (which can fail in fire); self-contained. Hang on wall like a picture, always on guard. Only $4.95, less batteries. Homes, farms, stores, offices, factories buy 4 to 12 at a time when you show how Merlite "smells" any fire before danger point. Make up to $2.70 on each one; up to $1,000 and more profit in a month!

FREE! Rush name, address for exciting money-making facts, complete Illustrated Sales Kit FREE—everything you need to make money first day. If you wish Merlite Fire Alarm Demonstrator, complete with batteries ($3.50), send no money, we send C.O.D. Or enclose $3.50 and we pay shipping charges. Money-back guarantee. Many localities now open—write TODAY!

MERLITE INDUSTRIES (Fire Alarm Div.)
114 E. 32nd ST. DEPT. F-10G NEW YORK 16, N. Y.
In Canada: Mopa Co., Ltd., 371 Dowd St., Montreal 1, P.Q.

MI Classified Ads

Your advertisement can reach this mail-buying audience of more than a million readers for only 80c per word . . . payable in advance (Check or M.O. please) . . . minimum 10 words. Copy to be inserted in August issue must be in the office June 3. Mail to MECHANIX ILLUSTRATED, 67 West 44th St., New York 36, N. Y. Word count: Zone number free. Figure one word: Name of state (New Jersey), name of city (New York); sets of characters as in key (14-D); also abbreviations as 35MM, 8x10, D.C., A.C.

SAVE MONEY • ORDER BY MAIL

• • • IMPORT-EXPORT

JAPAN TRADE Guide, 1956 Edition, just out May 20th! Importers-Exporters currently showing tremendous profits! Manufacture your item in Japan. Contains over 700 pages including latest individual Japanese industrial surveys, import-export regulations, shipping, patents, etc., plus comprehensive mercantile directory. Published in English by Japan's leading financial press under direct supervision of Japanese Government. Price $10.75 U.S.A. Send for free illustrated brochure and literature. Japan Trade Guide (MI), Box 3452, Terminal Annex, Los Angeles 54, Calif.

• • • ADVERTISING & BUSINESS SERVICES

25 CENTS, EACH name you supply us. Details, quarter. Enterprises, 439 N. Bouldin, Baltimore 24.

• • • AGENTS WANTED

MEN-WOMEN AGENTS: Sensational new moneymakers—Beautifully hand-painted plastic personalized photo enlargements, compacts, rings, bracelets, lockets, etc. Simply take orders, pocket 40% commission—we deliver and collect. Sales outfit free. Novelco, 3343 North Avenue, Chicago 47.

EASY HANDWORK makes fast-selling articles. Sample free. Sunmade Company, Brockton 64, Mass.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Haylings-MI, Carlsbad, Calif.

EARN $30 A day! Sell Dab-It, amazing pocket-size, stick-form, "no-ring" spot remover. Works like magic! Guaranteed! Fantastic appeal, profits! Free details! M & M, Dept. MI-1, 842 Third Ave., New York 22.

USED AND new watches $2 up. Free list. Southern Watches, Gray, Ga.

FREE! BEAUTIFUL Feather Pictures 200% Profit! Apartado 9036, Mexico 1, D. F.

MEN, WOMEN, Make Money Spare Time plus New Car as bonus for Encouragement. Amazing hosiery Guaranteed to wear without holes, snags, and runs, or replaced Free. For example lovely 60 gauge nylons Guaranteed for as long as 1¼ years, or replaced Free. Write Wilknit, 1866 Wash., Greenfield, Ohio.

NEW PRODUCT trial—no investment, Arrow Novelty, Box 144, St. Catharines, Ontario, Can.

$200-$1,000 WEEKLY: "SPARK-O-MATIC" Lifetime Spark Plug. Exclusive Territories. Almquist, Milford M19, Penna.

BUY WHOLESALE thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-WI, N. Y.

YOUR OWN business—Suits $1.50; Overcoats 65c; Mackinaws 35c; Shoes 12½c; Ladies' Coats 30c; Dresses 15c. Enormous profits. Catalog Free. Nathan Portnoy Assoc., 605-M West 12th Place, Chicago 7, Ill.

WHOLESALE CATALOG! 30-80% Discounts! Appliances, musical instruments, typewriters, phonographs, watches, jewelry, recorders, housewares, etc. Consolidated Distributors, 21-42 Lafayette, Paterson 15, N. J.

EVERY MAN a prospect. Request Free Sales Kit. Show line of belt buckles, individualized with prospect's personal name and emblems also transportation, police, firemen badges. Choice 3,000 emblems. Hook-Fast, Box 1425-MI, Providence, R. I.

PRINTING, ADVERTISING Salesmen—Excellent moneymaking sideline selling Decalcomania Name Plates, small quantities. Automobile initials, Sign Letters. Free Samples, "Ralco," XL, Boston 19, Mass.

GOLD OR Silver Letters, Numbers. Windows, Doors, Trucks. 1" to 6". 500% Profits—Free Samples. Atlas-R, 544 West 79th, Chicago 20.

I PUT photos on stamps. People see it but don't believe it. Agents wanted. 300% Profit For You. Free sample. National Photostamp Co., Dept. 3, 309 New York Ave., Bklyn., N. Y.

CALIFORNIA SWEET-SMELLING Beads. Sensational sellers. Free particulars. Mission, 2328GF West Pico, Los Angeles 6, Calif.

COULD YOU Use $24,000.00? Details $1.00, Wilco, Box 1036-M, Marietta, Ga. Satisfaction or Money Back.

GUARANTEED HOMEWORK! Immediate Commissions! Everything Furnished! Hirsch, 1301-A Hoe, New York City 59.

STAY HOME! Get $10.00 Orders in Every Mail—Keep $8.00. Everything Furnished. National, Box 88-M, Dorchester 22, Mass.

BOOK "505 ODD, Successful Businesses" free. Work home! Pacific-21C, Oceanside, Calif.

BUY WHOLESALE, 25,000 Items, Catalog 25c. Matthews, 1472-D9 Broadway, N. Y. C. 36.

NEW WAY to make money! Sell nothing! Don't even step out of your home unless you want to! Let others do the work. Experience unnecessary. We show you how. No money for stock. We ship your orders, paid or C.O.D. Catalogue, money-making plans, etc., free. Write Topval Corp., Lindenhurst 94, N. Y.

EARN TO $50 per day! New, amazing chemically-treated "Foam-O-Cel Sponge" cleans rugs, upholstery like new. Fast $1 seller, big profits. Free details. M&M, Dept. M-4, 842 3rd Ave., N. Y. C.

• • • SALESMEN WANTED

NEW JOBS open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, Dept. 19, 850 N. Dearborn, Chicago 10.

CASH IN on 1956 elections! Big advance comm. selling low priced Union Label political posters, cards, labels, book matches to candidates. Complete printing line for all businesses. Free kit. National Press, North Chicago 4, Ill.

GOLDMINE OF 600 money makers. Copy free. Specialty Salesman Magazine, Desk 7-B, 307 N. Michigan, Chicago 1.

ADVERTISING BOOK Matches—Cash in on big demand; sell union label matches. Cuts for all businesses and political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. F-656, 7530 Greenwood, Chicago.

AD MATCHES! Sell amazing designs—10, 20, 30, 40 and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part time. Buy nothing! Sales kit furnished. Match Corp., Dept. MI-62, Chicago 32, Ill.

BIG MONEY-MAKING Opportunity. Exclusive line work uniforms. Jackets, pants, shirts, coveralls. Advertising embroidered. Every business prospect. Outfit Free. Master Div., 718 Water, Ligonier, Ind.

WILL YOU wear new suits and topcoats without one penny cost and agree to show them to friends? You can make up to $30.00 in a day even in spare time, without canvassing. W. Z. Gibson, 500 South Throop St., Dept. T-626, Chicago 7, Ill.

$60 WILL EARN $10,000. Long needed invention. Proved sales plan. Send no money. Details free. Write Cyclo, Dept. 122, 3816 Dahlia, Denver, Colo.

• • • BUSINESS OPPORTUNITIES

BUY WHOLESALE! Resell at big profits. Brand name merchandise—appliances, cookware, housewares, watches, jewelry, dry goods, clothing, sporting goods, toys, gifts, etc. Free 124 page illustrated color catalog with confidential cost sheet. Merit Home Products, Dept. M-6, 107 Manhattan Ave., Brooklyn 6, N. Y.

BIG MONEY

In The Dry Cleaning Business

Learn At Home!

Let us teach you where, when, and how to open your own shop. You'll learn all the tricks of the trade. How to promote business, how to run your shop. You'll be amazed to learn that you can be in business for next to no cash at all. Many ex-students are now in business with no investment.

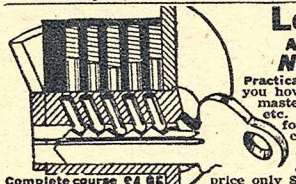
WRITE FOR FREE LITERATURE

Don't let lack of experience or education hold you back. These lessons are simple and easy to understand. You study in SPARE TIME and may enroll on our convenient time-payment plan. Remember, dry cleaning is a necessity. If you want to go into a fast-growing, profitable year-around business . . . .

WRITE TODAY . . . send your name and address for **FREE** information about this new, LOW-COST COURSE.

... A BUSINESS OF YOUR OWN

IMPERIAL SCHOOL OF DRY CLEANING
1700 Touhy Ave. Dept. S Chicago 26, Illinois



Locksmithing

AND KEY MAKING

Now Made Easy!

Practical up-to-date course teaches you how to pick locks, decode, make master keys, repair, install, service, etc. New self-instruction lessons for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop hardware dealer, gunsmith. 52 easy illustrated lessons. Full price only $4.95 postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Complete course $4.95 . . . now only $4.95
Nelson-Hall Co., 210 S. Clinton St., Dept. FU-3, Chicago 6, Ill.

REAL ESTATE

BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in classrooms in leading cities. Diploma awarded. Write TODAY for free booklet. No obligation.

FREE BOOK TELLS HOW

Approved for World War II and Korean Veterans

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
2020M Grand Avenue Kansas City, Mo.

MEN WANTED

Earn $100 Per Week and up

AUTO DIESEL MECHANICS

Master a trade with a future—learn Auto-Diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $100 per week and up. No previous experience necessary. Day and night courses. Approved for veterans. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave., N., Dept. 50 Nashville 3, Tenn.

. . . Swiss or American

Unique Sweazy System starts you making repairs right away. Develops your skill step-by-step. Teaches *modern methods* . . . professional short cuts. Learn by *personal attendance* or spare time *home study*. Approved for veterans. Free *Sample Lesson*. No obligation. Write today!

CHICAGO SCHOOL OF WATCHMAKING
2330 Milwaukee, Dept. 666. Chicago 47, Ill.

AMERICA'S NEWEST OPPORTUNITY

New fur-bearing animal now being bred in U. S. Offers huge profits to breeders. This fur is next to Mink NOW in price and will soon surpass it. 15 to 20 young per year. Most easily and economically raised animal known. 1½c per day to feed. ANY CLIMATE, disease resistant. Build yourself a sound future with this fine, registered stock. WRITE TODAY FOR FREE BOOKLET.

CABANA NUTRIA, INC.
636 M West Lemon Ave., Arcadia, Calif.

SAVE 50%

PHILIPPINE MAHOGANY LUAN PLYWOOD AT LESS THAN WHOLESALE

For Paneling Dens, Offices, etc. Use in Cabinets, Furniture, etc. Rotary cut. Both sides sanded. Bonded with finest resin adhesive. Face side unjointed. Shipped at lowest rates.

3mm (⅛") x 3FT. x 6 FT. $5.00 VALUE — 1.79 PER SHEET

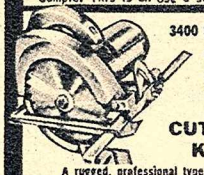
FREE SAMPLE ON REQUEST

¼" x 4FT. x 8FT. 9.50 VAL. — 4.49 PER SHEET

MINIMUM ORDER 8 SHEETS — MIN. ORDER 4 SHEETS

SAVE 40% ON TRANSLUCENT FIBERGLAS PANELS

Finest quality Fiberglas panelling. Available in most widths and lengths. Excellent range of colors. Write for FREE Booklet and Sample. This is an 85¢ a square foot value . . . . . ONLY 49¢ SQ. FT.



3400 RPM ½HP POWER SAW

COMPARES TO SAWS SELLING UP TO $49.50 WITH A 5½" BLADE

19.98

RIPS - CROSSCUTS

CUTS A FINISHED 2x4 LIKE A KNIFE THROUGH BUTTER

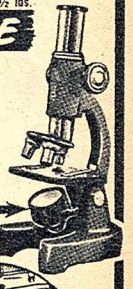
A rugged, professional type, adjustable saw. Will cut any angle from 0 to 45° Has an adjustable (0 to 6") rip fence. Safety-trigger switch on handle. Full ½ HP Universal AC-DC, 110-120 Volt, 60 cycle motor. Weighs only 6½ lbs.

NEW 60-450X MICROSCOPE

FEATURING 60, 120, 150, 180, 300 AND 450 POWER MAGNIFICATION

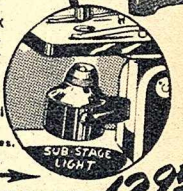
NEWLY DEVELOPED - Self-Contained SUB-STAGE LIGHT ELIMINATES NEED FOR EXTERNAL LIGHT SOURCE

Take advantage of our tremendous foreign purchase. Ideal for use by Amateur Scientist, Student, in Home Laboratory for study of insects, plant life, etc. . . .



✓CHECK THESE FEATURES

1 - Triple, revolving turret with 10X, 20X, 30X precision ground & polished lenses.
2 - Two interchangeable eyepieces, 6X and 15X with precision ground and polished lenses.
3 - SIX MAGNIFICATIONS for all purposes — 60X, 120X, 150X, 180X, 300X and 450X.
4 - NEW! Sub-stage with SELF-CONTAINED LIGHT. No external light source needed.
5 - Large sub-stage mirror for use with external light sources.
6 - All Metal Body — inclines through 90 degrees.
7 - Special Hardwood Case and 3 glass slides.



FREE! with MICROSCOPE — 8 Pc. DISSECTING SET with hardwood case.

12.95 MICROSCOPE AND DISSECT SET

IMPORTED 26" SPORT BIKES

The 'Jaguar' of Sports Bikes. Built with all the technical know-how of Europe's finest Bicycle Craftsmen. Has a 2-tone grey & cream baked enamel finish — plus other de-luxe features such as . . .

39.95

1 - 3-SPEED GEAR SHIFT with handlebar controls to choose gear ratio.
2 - TWO-WHEEL CALIPER HAND BRAKES.
3 - De-Luxe Saddle Bag. 4 - Pump and Tools.
5 - Kickstand and Sport Tires.

BICYCLE HEADLIGHT GENERATOR KIT — Includes Generator, Headlight and Taillight. 6 volts. Needs NO batteries. **5.95** EXTRA

NEW OUTDOOR FOUNTAIN

Converts any Outdoor Faucet to a Drinking Fountain for your Yard or Patio. Attaches directly to your regular faucet and you can enjoy a cool, refreshing drink at the press of a button. DOES NOT INTERFERE with the use of your garden hose. Made of polished nickel-plated bronze and brass with a durable, high impact styrene plastic bowl. Ideal for CHILDREN or ADULTS.

ARMY MACHETTE

Has 22" Vanadium steel blade. Hard-wood handle. 27" overall. Complete in rugged belt sheath. **1.98**

Order from this Ad. Pay by Money Order or Check. P.O.s accepted from D&B firms. 1/2 deposit with C.O.D.s. Prices FOB, Los Angeles.

Palley SUPPLY CO.

2263 E. VERNON AVE., DEPT. MI-6, LOS ANGELES 58, CALIF.

MI CLASSIFIED ADVERTISEMENTS

WANTED: HOME producers, to be subcontractors. Cast plastic products for manufacturers in our Clearing House Service. Thousands of easily-made items required. Cash in at home, without previous experience. Plastic Service Associates, Dept. 6-MI, East Boston 28, Mass.

"I EARN $400.00 a week." I've learned an amazing new method of printing colorful signs, banners, cards, posters, glasswear—anything. No printing press or other expensive equipment is necessary! Big Money-Making opportunity for anyone. Write for my secret and Revealing home-business plan—you'll be amazed! Mr. Anderson, Screen Print Company, M-6, Los Angeles 61, Calif.

FIX TYPEWRITERS. Inexpensive home course teaches Factory Secrets. Free Booklet. Write, Typewriter, Tarentum 3, Penna.

YOUR OWN name brand business. No investment; no inventory. Part time or full time. Sell famous brands of appliances, housewares, silverware, radios, vacuum cleaners, lamps, tools, clocks, watches, jewelry, etc., etc., over 1,000 items. Join thousands of successful independent dealers. Send for Free catalog and dealer price list. H. B. Davis Corp., Dept. V, 145 W. 15 St., New York City.

BREED RARE Tropical Fish At Home. Earn Big Money! Learn Secrets! Help fill huge demand. Amazing Opportunity! Free Plan. Tropicals, Los Angeles 61, Calif.

BRONZE BABY Shoes. Instructions, Equipment and Mountings for genuine electroplating process. Free Catalog. Hollywood Bronze Supply, Dept. B-5, 1624 East First Street, Los Angeles 33, Calif.

ENVELOPES ADDRESSED accurately, reasonably. Fast service. We have capable addressers in your city. Glenway System, 5713 Euclid, Cleveland 3, Ohio.

START A Buying Service, buy wholesale thousands nationally advertised products. Make big profits selling at sizeable discounts. Postcard brings details. American Buyers, Hertel Station, Buffalo 16-Y1 N. Y.

BE YOUR Own Boss. Inside information how hundreds of successful businesses started. Free booklet. Carmillo Products, Dept. MI, La Mesa, Calif.

REBUILD BATTERIES; Repair Dolls; Make Rubber Stamps; Catalogue "60 Ideas" Free. Universal, Box 1076-M, Peoria, Ill.

WANT TO Make Big Money At Home? $5 profit in an hour possible with Invisible Reweaving. Make tears, holes disappear from clothing, fabrics. Steady year-'round demand from cleaners, laundries, homes. Details Free. Fabricon, 8323-S. Prairie, Chicago 19, Ill.

BE YOUR own boss! No investment—No inventory — Big real profit-making wholesale catalog Free! Jay Norris, 487-J Broadway, N. Y. C., N. Y.

ONLY NEW moneymaking plan!! We sell your products. You build luggage and cases at home—we supply instructions—materials — tools — everything. Free details, Casecraft, 807-JG Sunset, Los Angeles 12.

FREE FOLIO "$5,000-$45,000; Unlimited Vacations." No merchandise, equipment. Unknown! Work home—sparetime. Haylings, MI, Carlsbad, Calif.

$5,199.90 WAS PAID to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 183, 2954 Admiral Way, Seattle, Wash.

$150 WEEK—EASY! Start home Venetian Blind Laundry. Revealing book free. B. R. Co., 101 S. 44th, Philadelphia 4, Penna.

$70 WEEKLY—HOME, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757E, Los Angeles 34.

PROFIT! PRESTIGE! Publish own magazine under your name! $3. per month! Sample, details 3¢. Filmer, 910 Marion, Pharr 9, Texas.

BRUSH PLATING Outfits for plating articles in the home and shop. No tanks necessary. Good income spare or full time. Free particulars. Gunmetal Co., Ave. A, Decatur, Ill.

GROW ORCHIDS at home—profitable—fascinating. Year 'round, Maine to California. No Greenhouse. Gorgeous Cattleyas, Cymbidiums, etc. Successful home grower shows you how. Free—full details. Flowerland, 4622 Wilshire, Los Angeles 5.

NEWEST SPARE, Full-Time Business. $5 to $10 hour possible. Paint with Suede—the finish with touch *and* eye-appeal. Beautify auto dashboards, signs, radios, toys, figurines, lamps—1,001 others. Complete, Step-By-Step Instructions sent for no-risk examination. Free details. Coast, Los Angeles 61.

LEARN SEWING Machine. Big money Repair, Sales, Service. Machines, "everything" wholesale. Taylor Service, Box 2126, San Bernardino, Calif.

YOU CAN Make Money at home in spare time taking magazine renewal subscriptions. No capital or experience necessary. All supplies furnished. Write Today! McGregor Magazine Agency, Dept. 520B, Mount Morris, Ill.

MAKE TOUGH, attractive building plastic, easily. Build better for less. 800% profit. Exclusive district. Bays Laboratory, Oklahoma City 9.

MAKE $3 AN Hour sharpening scissors. Details free. Flory, 3741 Rufe Snow Dr., Fort Worth 11, Texas.

MAKE FLEXIBLE Molds. Cast plaques, figurines. Free sample. Tooker, 630-E Chestnut, Hamilton, Ohio.

BIG PROFITS in full or spare time sharpening scissors, pinking shears, tools, etc. Let us show you how for under $50.00 investment. Experience unnecessary. Free details. Serr-Edge, Inc., 9753 Lorain Ave., Cleveland 2, Ohio.

ELECTROPLATING. PROFITABLE Home Business. Autoparts, novelties, baby shoes, mirrors. Easy, inexpensive home processes. Free booklet. Tyco Metals, Box 13231-DE, Houston 19, Texas.

COLORGLAZED CONCRETE pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leaksealing. Money-making projects. Booklets, details free. Men only. National Pottery, Grand Rapids, Minnesota.

LIQUID RUBBER, make flexible molds. Free sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

CASH FOR typing. Instructions 50c. Johnston, Box 488, Grand Central Station, New York 17, N. Y.

MONEY IN New Greaseless Doughnuts. Start in kitchen. No smoke. Sell stores. Free recipes. Irving Ray Co., 3605 South 15th Ave., Minneapolis 7, Minn.

WHOLESALE CATALOG! Appliances, Cameras, Watches! Cam Company, 6806MI-20th Ave., Brooklyn 4, N. Y.

"HOW TO Start a Business" booklet sent Free! If you Know any Trade—go into business for yourself! Learn the 9 easy steps to follow. We've guided 5,000 others to success. Revealing Free Booklet yours for the asking! Write! National Business Consultants, Office MJE, Los Angeles 61, Calif.

OPPORTUNITY TO earn $15,000-$30,000 annually. Franchise protected. Granted on $12,500 guarantee. Live at home. No merchandise to buy. Selfemployed. One of most exclusive and noncompetitive Businesses in United States and Canada. Send for free explanatory booklet. Harrell & Company, Box 8-F, Louisville, Ill.

TO $100.00 WEEKLY. Sparetime, home operated mailorder business. Successful "beginner's" plan. Everything supplied. Lynn, 10420-X National, Los Angeles 34.

NATURAL MOLDING Rubber — Extra Thick. Free Sample. Weave Baskets—Complete Kit 50¢ Prepaid. W. Wooley, 115-M Donald, Peoria, Ill.

MAKE PROFITABLE Products — Catalogue Free. International, 6347 Parnell, MI-6, Chicago 21, Ill.

IMPORT-EXPORT! OPPORTUNITY, profitable, world-wide, mail-order business from home, without capital; or travel abroad. Established World Trader ships instructions for no-risk examination. Experience unnecessary. Free details. Mellinger, F751, Los Angeles 24.

$46 FROM SQUARE Foot Plywood; Jigsaw necessary. Details Free. Woodarts, Bridgewater, Mass.

MAKE PERFUMES, Other Products. Sell Mailorder. "Carelabs," 1914 Chouteau-MI66, St. Louis 3, Mo.

MAKE MONEY Clipping Items from Your Newspaper! Write, Newscraft, MI-983-E. Main, Columbus 5, Ohio.

$100-$400 MONTHLY POSSIBLE, addressing envelopes, postcards, from mailing lists at home. Longhand, typewriter. Detailed Instructions only 25¢! X. Economy, Rowley, Mass.

VENDING MACHINES—No selling required. Send for Free 32-page illustrated catalog describing our numerous coin machines; also showing you how you can earn Amazing Profits either full or spare time. Parkway Machine Corporation, Dept. 3, 715 Ensor St., Baltimore 2, Md.

YOUR OWN Business—No Investment—No Inventory. Sell Name Brand nationally advertised items. Free Catalog. Confidential Wholesale Price List. Normandy Dist. Co., Dept. M, 133 Fifth Ave., N. Y. 1, N. Y.

FRANCHISE OPPORTUNITIES nationwide! Profitable distributorships, dealerships, agencies. Request interesting information immediately. National Franchise Reports MI-528, 333 North Michigan, Chicago 1.

MUSHROOM SPAWN ("seed") plus manureless, other, growing, marketing $1.00. Free literature. Luxurco, 641 South 19th, Newark 3, N. J.

DOLLARS: BABY Record Books, Kitty Kat Shoes, My Baby Albums. Eleven thousand new prospects daily. Sold by mail. Use our literature. No-Co-Ro, Capitola 9, Calif.

CAPITAL RAISING Methods. Copyrighted—"How and Where to Raise Capital." Finance your own business! Expand! Free details. Advance Publishing Service, Inc., Box 1377-MF, Miami 8, Fla.

Conquest Of Space

[*Continued from page 29*]

rocket people has a very good reason to believe that we have not lost the race, although the race is probably close. They are the electronics specialists, the guidance and control people, the radar men, the instrument men. They all know that a rocket, regardless of how good its motor is, is nearly useless unless you can guide it or have it guide itself.

Anti-aircraft rockets, ICBM's, or sounding rockets all must have control or they remain big skyrockets. Control and guidance is the single factor which separates modern rockets from their pyrotechnic ancestors.

Soviet progress in nucleonics startled the Western world at the Geneva nuclear power convention, but some experts still maintain that the Russian electronic industry has a long way to go to match ours. Without electronics to guide Russian missiles, it is rather illogical to think that they might surge ahead. Our electronics industry is the result of a great deal of individual incentive and the growing knowledge that progress means better products and markets for those products. Most people have no conception of the staggering assortment of advanced electronic material available today on the open American market. It is only an indication of what is available to American rocket people in the form of equipment and components still highly classified.

The real test will come in the sky. We may not know the answer until we see a bright speck in the sky near sunset. As a rough guess, it is about a 50-50 chance right now that that speck might be carrying a Red Star on its side.

It is time we stopped considering the conquest of space as a silly, fantastic dream. It is real. It is coming. And it is now a matter of national honor and prestige. It will determine for the rest of the world whether or not we are the wonderful Yankee wizards we claim to be. •

When answering advertisements please mention
MECHANIX ILLUSTRATED

Mammoth 1956 Wholesale Tool Catalog

TOOL CATALOG
YOUR NAME

$1.00 Puts You In Business

The opportunity now awaits you to own and operate your own business on a part time or full time basis in the lucrative field of HARDWARE, APPLIANCES, BICYCLES, CAMERAS, HAND TOOLS, FANS, POWER TOOLS, MOTORS, PAINTS, etc., or BUY TOOLS FOR YOUR INDUSTRIAL OR INSTITUTIONAL USES.

Buy Nationally Advertised Tools for Resale or Industrial or Institutional Use
NO INVESTMENT REQUIRED, BUY AS YOU NEED IT. A MILLION DOLLAR INVENTORY AT YOUR FINGER TIPS.

Discount UP TO 50%

$1.00 refund on first purchase or refund if you are not 100% satisfied.

Every one needs tools. Meet the demands of the growing "Do-it Yourself" markets. Sell direct from the jumbo buying guide—your cost is known only to you.

JUST FILL OUT COUPON

SILVO HARDWARE CO.
Dept. MI-6
108 Market St.
Philadelphia 6, Pa.

I am enclosing $1.00. Rush me your dealer's mammoth Catalog Today. If I am not completely satisfied with your plan, I understand that I can return the Dealer's Catalog for refund, and if I decide to order, my $1.00 will be deductible from my first order.

NAME.....
ADDRESS.....
CITY.....ZONE.....STATE.....

Valve Lifters Click? Get PYROIL
CLEANS, LUBRICATES, RESTORES LOST POWER

improved PYROIL

79¢

Now... Quiet 'em

Pyroil "B" added to engine oil clings to metal. Lifters won't stick and click. Pyroil fights heat, acid, corrosion. Increases mileage. Saves gas and repairs. Get Pyroil "B" today. Save more . . . buy in pints, quarts, gallons. Write for trial offer. Dept. MI-66,

PYROIL COMPANY
LaCrosse, Wis., U.S.A.
Toronto, Canada

IN CANADA $1.00

PYROIL
SUPER LUBRICANTS · WORLD FAMOUS SINCE 1929

MI CLASSIFIED ADVERTISEMENTS

SPECIALIZED MAGAZINES give you new ideas. Examine current copies, one or all those covering your field. 5,166 different publications—all businesses, trades, professions, sports, hobbies, etc. Write today for Free List. Commercial Engraving Publishing Company, 34W North Ritter, Indianapolis 19, Ind.

"MONEY SECRETS" Repairing Sewing Machines. Beginners lesson 20¢. Purdy's, 207-I Weatherford, Texas.

CASH FROM Sawdust (seventy methods). Tin-Cans (thirty methods). Newspapers (eighteen methods). Instructions 50¢ each. All three $1.00. Charles Company, 12-GXW, Norwood, Ohio.

ADDRESSING AND Mailing our Advertising Literature can earn you $300 monthly in Sparetime! Everything Supplied. John R. Hall, Room 1002, 509 Fifth Avenue, New York 17, N. Y.

METALIZE BABY shoes, jewelry, gifts. Free catalog. Metalite, Box 73136, Los Angeles 3.

SELL MERCHANDISE By Mail! Proven Successful Personalized Idea-Mailbox Service Assures Your Success. Everything Furnished. Big Earnings. Associated, Box 53-M, Boston 22, Mass.

BOOK "505 ODD, Successful Businesses" free. Work home! Expect something Odd! Pacific-23C, Oceanside, Calif.

MAIL ORDER—positive profit home business now possible. Advertising agency executive reveals success formula. Operate without inventory, no-risk advertising. Details free: Impact! 2108 Payne, Dept. 3-6, Cleveland 14, Ohio.

RECEIVE BEAUTIFUL Samples, Gifts, from abroad! Exporters List $1. Weyman, D-156, 939 Vanderhoeven, San Antonio 9, Texas.

AMBITIOUS? WE establish you in your own business, supply catalogues, circulars etc., ship orders under your name, paid or C.O.D., show you exactly what to do. Household items needed in every home. Sell direct, by mail or through agents. Catalogue, plans, details absolutely free. Write Topval Corp., Lindenhurst 829, N. Y.

HOW AND where to obtain Capital. Free details, Star Service, Wapakoneta, Ohio.

• • • HELP WANTED

"FOREIGN, ALASKAN, USA, Jobs!!" Million Americans Employed Overseas! Opportunities Galore. Latest Copyrighted Reports. Who to Contact for Highest Paying Jobs. To $1,500.00 Monthly. Laborers—Trades—Truck Drivers—Equipment Operators—Helpers—Clerks—Engineers—Many Others. Over 52 Countries—St. Lawrence Project, Spain, Latin America, Northern Projects, Europe, Pacific, etc. Year Registration—Advisory Service. Application forms. Unconditional Money-Back Guarantee. Only $2.00. Airmailed $2.25. (COD's Accepted.) International Reporter, Central Station, St. Louis, I-BH, Mo.

THOUSANDS OPPORTUNITIES, New York! Full information, $1.00. Farrell Enterprizes, ES, Liberty, N. Y.

FOREIGN JOBS—Latin America, Alaska, Canada, up to $1,500 monthly. Up-to-date 1956 Foreign Service Directory gives complete information; hot list of firms hiring for Military and Civilian Construction, Aircraft, Oil, Exporters—Importers, Mining, $1.00. How-When-Where to apply. 9th successful year! Global Reports, Box 883-MI, Hollywood 28, Calif.

GOOD JOBS Now Available in Southern California. Send $1.00 for latest guaranteed list. California Jobs, 601-F South Vermont, Los Angeles 5, Calif.

SOUTHERN CALIFORNIA jobs and business opportunities. Complete classified section Los Angeles' largest newspaper airmailed—$1.00. Western Information Service, P. O. Box 1287, Long Beach, Calif.

JOBS PAYING to $350 weekly now available on overseas and American projects. Men and women. All trades. Transportation paid. Free information. Write Transworld, Dept. 16, 200 W. 34th St., New York, N. Y.

JOBS IN Chicago and Vicinity, Sunday classified Section, $1.00. H. Sims, 216 West Jackson Blvd., Chicago 6, Ill.

WELCOME SOUTH, Brother! Columns Atlanta Jobs air mailed $1.00. Add 25¢ Business Opportunities. McRae, Box 3041, Decatur, Ga.

AVIATION AND Guided Missiles employment (U. S. A. and Canada). Companies and persons to contact $1.00. Advisory Service. Pestech, Box 548M, St. Louis 1, Mo.

NEW YORK help wanted ads. Airmailed $1.00. Stephensons, 243 Main Street, New Rochelle, N. Y.

• • • MONEYMAKING OPPORTUNITIES

START YOUR own business on credit. Your own boss. 1,598 dealers sold $5,000 to $32,000 in 1955. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant profitable business backed by worldwide industry. Write Rawleigh's, Dept. E-U-MOM, Freeport, Ill.

MANY MONEY-MAKING Opportunities in the great building industry are open to men looking for local manufacturing enterprises that can start small and grow big. Send 10¢ for copy of Concrete Facts which gives information on 14 different products serving building owners and contractors. Write Editor, Concrete Facts, 501 Ottawa Avenue, Holland, Mich.

FREE "$5,000-$45,000; UNLIMITED Vacations." Work home—sparetime. No merchandise, equipment! 100 other homework businesses! Haylings-MI, Carlsbad, Calif.

ENVELOPE ADDRESSING facts—extra income opportunities revealed thru HM service. Free details. Maxwell, Dept. 46-6, Wooster, Ohio.

SELL TITANIA Gems; far more brilliant than diamonds. Catalog free. Diamonite, 2420-X 77th, Oakland 5, Calif.

SPARETIME ADDRESSERS MAKE $25.00 — $50.00 Weekly. Details free. Glenway, 5713 Euclid, Cleveland 3, Ohio.

START A Buying Service, buy wholesale thousands nationally advertised products. Make big profits selling at sizeable discounts. Postcard brings details. American Buyers, Hertel Station, Buffalo 16-Z1, N. Y.

WANT TO Make Big Money At Home? $5 profit in an hour possible with Invisible Reweaving. Make tears, holes disappear from clothing, fabrics. Steady year-'round demand from cleaners, laundries, homes. Details Free. Fabricon, 8347-S Prairie, Chicago 19, Ill.

$25 WEEKLY POSSIBLE, sparetime, addressing envelopes at home. Temple Co., Muncie 8, Ind.

DETECTIVES — EXCELLENT Opportunities. Experience unnecessary. Detective Particulars free. Write, George Wagoner, 125-J West 86th, New York 24.

$150 WEEK—EASY! Start home Venetian Blind Laundry. Revealing book free. B. R. Co., 101 S. 44th, Philadelphia 4, Penna.

$5,199.90 WAS PAID to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 184, 2954 Admiral Way, Seattle, Wash.

SELL SPARETIME from free wholesale catalog. Nationally advertised watches, jewelry, appliances. Big discounts, earn huge profits. Save on personal needs. No investment. Louis Perloff, Dept. MI, 733 Walnut Street, Phila., Penna.

ADVERTISING BOOK Matches—Cash in on big demand; sell union label matches. Cuts for all businesses and political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. FX-656, 7530 Greenwood, Chicago.

MAKE MONEY with your camera. Amazing new low cost color enlargements can bring you hundreds of dollars in spare time. Nothing else like it! Send 10¢ for samples and eye-opening facts. Dept. MI-6A, Polypix Co., 723 S. Wells, Chicago 7, Ill.

RAISE WORMS for profit, hobby or own use. 500 red breeders will start. $3.00 with instructions guaranteed. Putnam Ranch, Hawthorne, Fla.

PRIZE CONTESTS provide Fabulous and Confidential Home Income! Here's How and Where to Win Your Share! Enclose Stamp! National Contest Bulletin, Box 2685-R, Miami 16, Fla.

OPERATE RESTAURANT or diner. Free booklet reveals plan. Write Restaurant Arts, MO-36, Fremont, Ohio.

MAKE $25-$50 WEEK. Home—spare time. Clipping newspaper items. Certain clippings worth $1-$5 each. Particulars free. National Plans, Box 81-X, Knickerbocker Station, New York.

$1,000. MONTHLY POSSIBLE raising Redworms; Large African Nightcrawlers! Backyard, Garage, Basement. Illustrated Booklet explains raising, packing, marketing. 25¢ postpaid! Ozark Worm Farm-4, Willow Springs, Mo.

VENDING MACHINES—No selling required. Send for free 32-page illustrated catalog describing our numerous coin machines; also showing you how you can earn Amazing Profits either full or spare time. Parkway Machine Corporation, Dept. # 5, 715 Ensor St., Baltimore 2, Md.

HAVE HOME Mail Business! Get $ $ 10 Orders In Every Mail—Keep $8.00. Everything Supplied. Hutchinson, Box 87-A, Dorchester 22, Mass.

EARTHWORMS. PRIZED English Hybrid. Sensationally profitable! Bait! Soil! Breeders, 1,000—$10.00. Best buy, gallon (culture, worms, eggs) $5.00. Postpaid instructions $1.00. Dealers write. Horton's Hatchery, 9492 South Linden Rd., Swartz Creek, Mich.

FREE BOOK "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-22C, Oceanside, Calif.

WANT TO go in business for yourself without capital? We show you how. Start part time your own home. Postcard brings catalogue, instructions, etc., absolutely free. Topval Corp., Lindenhurst 830, N. Y.

Dear Editor

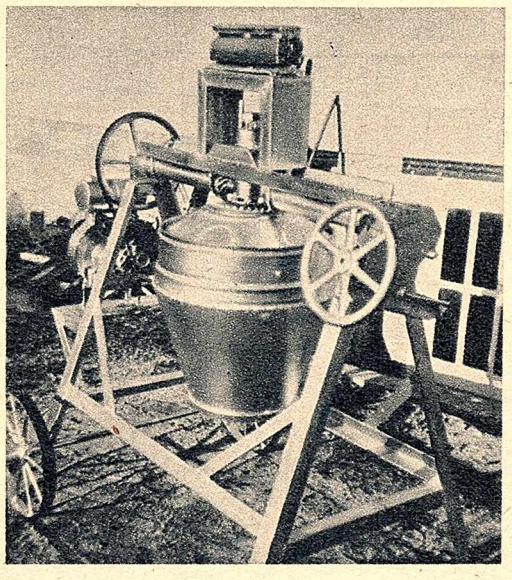
[*Continued from page 21*]

ple have remarked that atomic power should be used in airships but your proposal is specific, concrete and sensible. Allow me to congratulate you on the idea of the year.

Lewis Grant, Jr.
Chicago, Ill.

Thanks, Lou.

● Homemade Cement Mixer



I would like to thank MI for publishing the Concrete Mixer article by Arthur W. Robinson in the Jan. '56 issue. The machine is everything the author said it was.

You will find a photo of the mixer enclosed. Thanks again for the best in a mechanical magazine.

G. D. Bryant
Whitesburg, Ga.

Nice job, Mr. Bryant. Hope you enjoy your Golden Hammer tie clip.

● Typewriter Info Requested

I have in my possession an old Oliver (Number 9) typewriter. I am interested in any information you can give me concerning the company who made it, value and manufacturing dates.

Maybe some typewriter collector will want it.

Billy Moore
Box 12
Okolona, Miss.

Anybody interested?

[*Continued on page 37*]

PREPARE FOR BETTER JOB, BIGGER PAY IN SPARE TIME AT HOME

Today, choose the job you want—and prepare for it in time you might otherwise waste. Or if you are already in the work you like best, start training now for quicker promotion and increased pay. During more than 50 years AMERICAN SCHOOL has helped ambitious people to reach higher goals. Check subject that interests you and mail coupon for full information.

AMERICAN SCHOOL, Dept. GA28, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

☐☐☐☐☐☐☐☐☐

Diesel Technician
Drafting—Building Trades
Drafting—Machine Trades
Electrical Engineering
Electricity—Practical
Electronics—Industrial

☐☐☐☐☐☐☐☐☐

HIGH SCHOOL COURSES
Mechanical Engineering
Mechanical Technology
Metalworking Courses
Plumbing—Practical
Private Secretary
Retail Merchandising
Salesmanship—Outside
Sheet Metal Work
Tool Making

☐☐☐☐☐☐☐☐☐

Accounting
Apprenticeship Courses
Architecture & Building
Automotive Technician
Better Foremanship
Bookkeeping
Business Management
Civil Engineering
Contracting

☐☐☐☐☐☐☐☐☐☐

Name.....Occupation.....
Home Address.....Age.....
City.....State.....
Canadians: Write American School, Dept. GA28, 1610 Sherbrooke St. W., Montreal

MAIL COUPON NOW

LEARN METALCRAFT and JEWELRY MAKING
Low Cost Home Training Now Available

Make money. Learn profitable skills and arts of decorative metal and jewelry crafts. Course is complete. Professionally prepared. Easy to master. Special tools and materials furnished.

Write for Free Booklet **INTERSTATE TRAINING SERVICE**
DEPT. K-4 PORTLAND 13, OREGON

10-Shot Pellet Gun

Shoots 10 pellets as fast as you pull trigger. For indoor target work & fun. Automatic action. Holds 10 pellets. Full size model of Colt .45. 6½-in. long. Plastic moulded. Moving parts of die cast metal. With supply of pellets. (Extra Pellets, 25c Pkg. Holster 50c) Set..... **$1.65**
Johnson Smith & Company, Dept. 311, Detroit 7, Mich.

New Catalog of 3200 Novelties 10c
3200 novelties, jokes, tricks, magic, gadgets, fun-makers, hobbies, timesavers, jewelry, radios, home-craft, photo items, etc. Catalog 10c.
Johnson Smith & Company, Dept. 311, Detroit 7, Mich.

DRAFTING is the way to Big Income OPPORTUNITIES!

Learn at home in your spare time. Become a professional Draftsman. Enjoy good pay, respected position in an ever growing field. CHRISTY TRAINING is easy and clear. You learn by making actual drawings, planning production, see things develop. You learn the interesting, easy-to-remember way by doing.

PAY AS YOU LEARN PLAN

CTS will send you 50 illustrated drafting manuals, set of professional drafting instruments, equipment and supplies plus a portable drafting table . . . everything you need! Send name for FREE BOOK and PAY LATER FORM. CHRISTY TRADES SCHOOL, 4804 N. Kedzie, Dept. DB-5002, Chicago 25.

MI CLASSIFIED ADVERTISEMENTS

BIG PROFITS. Selling ties ($2.00 value) $6.50 dozen. Free catalog. Empire Cravats, 611M Broadway, New York 12.

• • • PROFITABLE OCCUPATIONS

HOW TO Fix Watches Overnight with self-taught "Do It Yourself Method", 70 drawings, instructions, 65 troubles, wholesalers listed, 1st publication. Unconditional Refund 7 days. Manual $1.50 postpaid. Web Service, Box 2489, Denver 1, Colo.

START MAIL order business in your own home. We supply catalogues, circulars, etc., ship orders under your name (no stock to carry) and show you exactly what to do. Postcard brings complete details, instructions, catalogue, etc., absolutely free. Topval Corp., Lindenhurst 831, N. Y.

DETECTIVES—MAKE Secret Investigations. Interesting occupation. Write, George Wagoner, 125-J West 86th, New York 24.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Haylings-MID, Carlsbad, Calif.

BUY WHOLESALE thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-XI, N. Y.

$5,000 FROM HALF Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

$150 WEEK—EASY! Start home Venetian Blind Laundry. Revealing book free. B. R. Co., 101 S. 44th, Philadelphia 4, Penna.

$5,199.90 WAS PAID to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 102, 2954 Admiral Way, Seattle, Wash.

OPERATE PROFITABLE Mail Order Business! Splendid Opportunity. For details write: Thomas Bond, 1637E West Vernon, Phoenix, Ariz.

MAKE NEW greaseless doughnuts in kitchen. Sell stores. Free recipes. Dwight Ray, 3605 South 15th, Minneapolis 7.

JOBS—HIGH Pay. South America, the Islands, USA, foreign countries. All trades. Clerical, labor, engineers, drivers, others. Women also. Fare paid. Application forms. For information. Write Section 92K, National Employment Information, 1020 Broad, Newark, N. J.

WANTED MEN, Women. Home Producers, Figurines, Book Ends, other Novelties. No expensive molds needed. Particulars. Plastex, 114 Water, Mount Holly, N. J.

MUSHROOMS GROWN, boxes. Manureless process. Spawn $1.00. Gordin, 553 William, Winnipeg, Manitoba.

BOOK "505 ODD, Successful Businesses" free! Work home! Pacific-24C, Oceanside, Calif.

• • • BARGAINS

DISCOUNTS 20% TO 50%—Cameras, projectors, tape recorders, lenses. Write for individual quotations, no catalogs. Classified Camera G, 2375 East 65 St., Brooklyn 34, N. Y.

18 GOOD, INTERESTING Novelties: magnetic top, parachute, compass, etc. $1.00 complete. Pacific-New England Corp., Box 1152, Studio City, Calif.

WHOLESALE CATALOG! 30-80% Discounts! Appliances, musical instruments, typewriters, phonographs, watches, jewelry, recorders, housewares, etc. Consolidated Distributors, 21-44 Lafayette, Paterson 15, N. J.

PROTECT YOUR Health. Rid your Home-Office of Flying, Crawling Insects. Also Airborne germs. New Scientific method. Free Details. Monetta's, 3007 Middletown Road, Bronx 61, New York.

WHOLESALE CATALOG! Appliances, cameras, watches. Postcard: Selbyco, Decatur 233, Ill.

• • • CHEMICALS & SUPPLIES

CHEMICALS, SUPPLIES. Catalog 25¢, refundable. Laboratory Sales, Box 161-G, Brighton, Mass.

• • • FORMULAS, PLANS

LATEST—BEST Formulas. Genuine Moneymakers. Free literature. Kemistry, Park Ridge 40, Ill.

ONE FORMULA $5.00. List with first order. Milici-MI-Whitehead Chemists. Box 434, Ruskin, Fla.

REAL MANUFACTURING Formulas. Lists free. W. Cummings, 228 Gordon, Syracuse 4, N. Y.

ANY FORMULA $3.00. Catalog—Mfg. Treatise 10c. J. Belfort, 192 N. Clark, Chicago 1.

• • • GEIGER COUNTERS, TREASURE FINDERS

URANIUM FINDING made easy! Completely transistorized Geiger counters. Extra sensitive. Lightweight. Scientifically engineered. Unconditionally guaranteed. Also complete line prospecting instruments from $19.95. Write for free information, techniques. Universal Atomics Corp., Dept. MI4, 19 East 48th Street, New York City.

SCINTILLATION COUNTER with built-in speaker, loudspeaker alarm. Metal Locator works over salt water. No ground pick-up. Geiger Counters. Free Literature. Gardiner Electronics, 2545 E. Indian School Rd., Phoenix, Ariz.

TREASURE—METAL-MINERAL Detectors. M-Scope. Used worldwide for Treasure Hunting. Mineralights, Geiger, Scintillation Counters. Prices from $14.75. Fully Guaranteed. Use our Time Payment Plan. Free booklets on Treasure Hunting, Uranium Prospecting. Free Catalog. Fisher Research Lab., Inc., Dept. MI-1, Palo Alto, Calif.

GOLD AND Silver Detectors, Geiger Counters for Uranium. Vita-Lites. Powerful—Sensitive—Guaranteed! Free information. Detectron Corp., 5528 Vineland Avenue, North Hollywood, Calif.

• • • OF INTEREST TO WOMEN

A DRESS Shop In Your Home. No Investment. Good commissions selling better dresses. Write Modern Manner Clothes, Hanover XW, Penna.

20 SECRET WINE Recipes Easily Made $1.00. Rosa, 387 E. 156 St., New York City.

• • • PRINTING, MULTIGRAPHING, MIMEOGRAPHING

QUICK SERVICE Printing. Letterheads, envelopes, cards, labels. Free circular. Harold Kroll, Seymour, Wisc.

BUSINESS PRINTING. Reasonable. Catalog Free. Howprint, 723-L Eunice, Webster Groves 19, Mo.

QUALITY PRINTING—Lowest Prices—Samples free. Wilcox, 5466 Gilmore, St. Louis 20, Mo.

RUSH SERVICE 100 8½x11 Letterheads $2.00 postpaid. Bass Press, Knox, Ind.

• • • PRINTING OUTFITS & SUPPLIES

DO YOUR Own Printing. Save money. Simple rules. We supply everything. Print for others; good profit. Raised printing like engraving, too. Have home shop. Details free. Kelsey Presses, V-57 Meriden, Conn.

MAKE YOUR Own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 3, Wisc.

PRINTING PRESSES, type, supplies. Lists 3c. Turnbaugh Service, Mounted Route, Mechanicsburg, Pa.

RUBBER STAMPS, quick professional service, catalogue. Hawthorne Co., Otsego, Mich.

• • • RUBBER STAMPS & MARKING DEVICES

3 LINES—$1.00. FAST, professional service guaranteed! Artcraft, P. O. Box 8038, West Palm Beach 6, Fla.

RUBBER STAMPS: First line 65¢; additional lines 35¢. Kuhn Stamps, Victoria, Kans.

• • • STAMP COLLECTING

KOREA FLOWERS, Formosa Chiang Kai-shek birthday issue, Hungary pictorials, Ceylon (elephant) Royal Visit, South Africa Cape of Good Hope triangle Centennial, Italian Colony flowers. Niue bicolor maps, African wild animal set. Many more beauties. All for 25¢ with interesting approvals. Every continent represented in this collection. Modern Stamp Co., Dept. C-3, Ferrysburg, Mich.

225 STAMPS FOR Only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries cataloguing up to 25c each! Also approvals. Mystic Stamp Company, Camden 30, N. Y.

TWO $5.00 U. S. stamps plus 20 different 10c with U. S. approvals. Irwin Stamp Co., Box 1118, Brooklyn 30, N. Y.

50 U. S. COMMEMORATIVES 25c. Mammoth Packet List Free. Econopackets, Box 168, Riverside 31, Calif.

111 TRIANGLES. DIAMONDS. Rectangles. Nudes—Warthog—Death Stamp. Bargain Approvals—Catalogs, 25¢. Imperial, 2545MI Fourth, San Diego 3, Calif.

513 DIFFERENT WORLDWIDE from Cunha, Sudan, Libya, etc., cataloging over $10 only 35¢. Approvals. Littleton Stamp Co., Littleton, Q4, N. H.

"WOW! 135 ALL Different Germany 10¢" Zeppelins, Semi-Postals, Airmails, High Values. Big bargain lists and approvals included. Jamestown Stamp, Dept. A6MIC, Jamestown, N. Y.

NUDES SET: colorful approvals—10c! Atlas, 2830-N Eisenhower, Racine, Wisc.

UNITED STATES commemorative collection containing 33 different 10¢ approvals. White, 516-M Avenue L, Brooklyn 30, N. Y.

Dear Editor

[Continued from page 35]

● Invention Wanted! Invented

In your October Inventions Wanted! column you spoke of filtered exhausts to do away with the threat of carbon monoxide poisoning. You'll see this sooner than you think. Tests are now being made with a new type of exhaust (muffler) with porcelain rods coated with a catalyst that would turn the carbon monoxide into harmless carbon dioxide.

Michael Gelles
Brooklyn, N. Y.

● Sun Power

I really enjoyed Frank Tinsley's article Flight To The Stars On Sun Power in the Jan. '56 issue of MI. But I'm a little confused about the power source of the ship.

When, and if, the reflectors of the solar ship are not facing the sun, how does the ship get its needed power?

Mickey Owen
Tacoma, Wash.

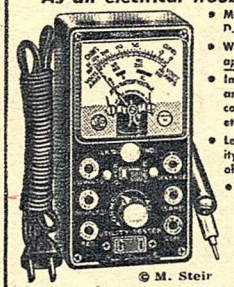
The parabolic reflectors are mounted in such a way that they can always be turned toward the sun.

DON'T DO-ITS

Superior's New Model 70 UTILITY TESTER

FOR REPAIRING ALL ELECTRICAL APPLIANCES MOTORS • AUTOMOBILES • TV TUBES

As an electrical trouble shooter the Model 70:



© M. Steir

- Measures A.C. and D.C. Voltages, A.C. and D.C. Current, Resistances, Leakage, etc.
- Will measure current consumption *while the appliance under test is in operation.*
- Incorporates a sensitive direct-reading resistance range which will measure all resistances commonly used in electrical appliances, motors, etc.
- Leakage detecting circuit will indicate continuity from zero ohms to 5 megohms (5,000,000 ohms).
- Will test toasters, Irons, Broilers, Heating Pads, Clocks, Fans, Vacuum Cleaners, Refrigerators, Lamps, Fluorescents. Fans, Switches, Thermostats, etc.
- Will test *all* TV tubes for open filaments, inter-element shorts, burned out tubes, etc.

As an Automotive Tester the Model 70 will test:

● Both 6 Volt and 12 Volt Storage Batteries ● Generators ● Starters ● Distributors ● Ignition Coils ● Regulators ● Relays ● Circuit Breakers ● Cigarette Lighters ● Stop Lights ● Condensers ● Directional Signal Systems ● All Lamps and Bulbs ● Fuses ● Heating Systems ● Horns ● Also will locate poor grounds, breaks in wiring, poor connections, etc.

Handsome round-cornered molded bakelite case, 3½" x 5⅞" x 2¼". Complete with all test leads. Also included is a 64 page book giving detailed instructions for testing all electrical appliances, automotive equipment, TV tubes, etc. Only $15.85

SHIPPED ON APPROVAL
NO MONEY WITH ORDER — NO C.O.D.

Try it for 10 days before you buy. If completely satisfied then send $3.85 and pay balance at rate of $4.00 per month for 3 months — No Interest or Finance Charges Added. If not completely satisfied, return to us, no explanation necessary.

MOSS ELECTRONIC DIST. CO.
Dept. D-238, 3849 Tenth Ave., New York 34, N. Y.
Please rush 1 Model 70. I agree to pay $3.85 within 10 days after receipt and $4.00 per month thereafter.
Name
Address
City Zone State

GET MAXIMUM USE OF 4-WHEEL DRIVES!

MAKE 2 VEHICLES OUT OF 1!

New LOCK-O-MATIC!
- Automatic free-wheeling 2 w. d.
- Automatic 4 w. d. forward & reverse
- Locking control for "solid" 4 w. d.

Your 4 w. d. is a 4 w. d. work horse or 2 w. d. "pick-up" as you need it—*as you shift!* No drag, gear whine, shimmy in 2 w. d.; big savings in gas, tires, repairs. For all 4 w. ds. to 1½ tons at dealers or write:

Jeep

WARN HUBS
WARN MANUFACTURING CO.
Riverton Box 6064-C6 Seattle 88, Wash.

BECOME AN EXPERT IN

TRAFFIC and TRANSPORTATION

TODAY qualified men in this field earn $4,000 to $10,000 and up. Thousands are needed. We train you in spare time at home for executive positions in Traffic Management.

LaSalle's complete Traffic and Transportation program gives you a thorough knowledge of this field. Program covers Transportation Agencies—How to Ship by Rail, Express, Water, MOTOR TRUCK, Air, Freight Forwarder and Mail Carriers.

Investigate the splendid opportunities available. Low cost-easy terms. Placement counsel and help. Write today for FREE 48-page book "Traffic and Transportation —the Fast Growing Profession."

LASALLE EXTENSION UNIVERSITY *A Correspondence Institution*
417 S. Dearborn St., Dept. 6493T, Chicago 5, Illinois

MI CLASSIFIED ADVERTISEMENTS

WORLD'S LARGEST stamp (7½x14 inches). A real curiosity! Retails for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 9, Mass.

CANADA—NEWFOUNDLAND collection including early issues, commemoratives, pictorials and high values. Plus set of fascinating triangle stamps. Plus set of unused British Colonies. Plus large stamp book. All four offers free. Send 10c to cover postage. Empire Stamp Corp., Dept. MI, Toronto, Can.

WEIRD DIAMOND Shape Coffee Stamp. Lovely Athlete Triangle, plus first American Commemorative. Icy far off Greenland, Idol Dancer, etc. Everything only 5c with approvals. Capital Stamps, Little Rock 5, Ark.

FREE! CATALOG! About stamps. Illustrated. Free! The Stampmart, Hartford 1, Conn.

HOW MANY of your album pages would a few stamps complete? Want to fill them? Try our approval books of 1,000 at 1¢ and 2¢. Values will amaze you. Also U. S. Roseland Stamps, Dept. C-36, Spring Lake, Mich.

PICTORIAL PACKET from Antigua, Barbados, British Guiana, British Honduras, Burma, Curacao, Leewards, Rhodesia, Trinidad, Tobago, and many other hard to get countries. Bi-colors, topicals. Tremendous value. Each stamp a beauty. 10¢ with inexpensive, attractive approvals. Wolverine Stamps, Dept. C-27, Fruitport, Mich.

25 UNUSED CHINA, 10¢ with approvals. Kenny, Box 2142, Pittsburgh 30, Penna.

SELECT STAMPS on approvals. U. S. and foreign. Kingsbury, Fairfax 1, Vt.

70 DIFFERENT U. S., including 35 Commemoratives 25¢. Seidenberg, Appleton, Wisc.

100 OLD U. S. stamps between 1861 and 1935 only $1.00. Roush Stamps, 51 Chestnut, Mansfield, Ohio.

ECONOMICAL ½-1-2c APPROVALS, over 22,000 varieties available. Dresel, Box 270-B, New York 25, N. Y.

OLD SCARCE U. S. Seconds On Approval. Slight imperfections, lowest prices. Hernfelder, Clintonhill Sta., Newark 8, N. J.

8 CANAL ZONE 10¢. Approvals. Merkel Stamps, 45 Cherry, Holyoke, Mass.

25 PHILIPPINES 10c. WORLDWIDE Approvals. Moffat, 740-B Milton, Rock Hill, S. C.

30 DIFFERENT COMMEMORATIVES. 1893 up 10¢. U. S. Approvals. K & B, Box 70, Brooklyn 23, N. Y.

TEN TRIANGLES and 50 other stamps 10¢ with approvals. Bennett, Candor 6, N. Y.

ROOSEVELT GREECE, Pope Triangle, Greenland, Israel, 51 others, 5c. Approvals. Longhorn, Box 3068C, Lubbock, Texas.

TRAVEL THRU 50 countries! A virtual world cruise! 50 stamps, each from a different country, Abyssinia to Zanzibar. Bargain unsurpassed! To new approval applicants, 5¢. Avalon Stamp Co., Dept. K, Springfield, Mass.

FIRST U. N. Set. Among World's Prettiest. Only 10¢. Approvals. Welles, Box 1246-L, NYC 8.

FREE: MINT British Colonies from Brunei, Papua, New Guinea, Caymans, Gilbert Ellice, Seychelles, Sarawak, Grenada. Free with approvals. Viking, Great Neck 4, N. Y.

300 DIFF. WORLD Wide 25c Plus surprise packet. Mammoth Packet list free. Econopackets, Box 168, Riverside 31, Calif.

AMERICAN STAMPS! Coins! Extensively! Sullivan, 127-C East 4th, St. Paul 1, Minn.

DEALERS' LISTS. Wholesale Approvals. 10¢. Bryan, 2545MI Fourth, San Diego 3, Calif.

FREE!! GIANT catalog. Offering thousands of bargains. Sent with beautiful approvals. Jamestown Stamp Co., Dept. E6MIC, Jamestown, N. Y.

1956 U. S. 72 PAGE catalog free. Stone, 192 Washington, Boston 8M, Mass.

• • • RARE COINS

SAN FRANCISCO Mint Closed! Made only cents and dimes in 1955. In short supply and great demand. One each, brilliant uncirculated, for 25¢. Free coin lists with order. Bryson Coin Company, 612 White, Toledo 5, Ohio.

FIVE FOREIGN coins from Switzerland, Belgian East Africa, etc., plus foreign banknote, only 10¢ with coin approvals. Littleton Coin Company, Littleton R4, N. H.

FREE! FOREIGN Coin, banknote and Coin Collectors Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coinco, Springfield 9, Mass.

MORGAN DOLLARS; 1885-86-89-90-91 $2.00 ea. Uncirculated. Illustrated Catalogue, 25c. Shultz, Salt Lake 10, Utah.

16 PAGE U. S. coin list 10¢. Stoney, 192 Washington, Boston 8M, Mass.

• • • OLD COINS WANTED

$3,000.00 FOR 1913 LIBERTY Head Nickel. Dimes 1894-S, 1895-O, 1916-D. Quarters 1827, 1896-S, 1901-S, 1913-S, 1923-S, we pay $5.00 to $1,500.00. Certain dates—Lincoln Cents, $60.00. Indianheads, $60.00. Large Cents, $500.00. Eagle Cents, $200.00. 2¢ Pieces, $45.00. 3¢ Pieces, $60.00. Half-dimes, $500.00. Shield Nickels, $100.00. Old Dimes, $300.00. 1875 Canadian Quarter, $50.00. Hundreds of others worth $5.00-$500.00. Wanted—Half Dollars, Dollars, Gold Coins, Paper Money, etc. Know their true value. Our large Illustrated Guarantee Buying—Selling Catalogue, giving complete allcoin information—send $1.00. Purchase catalogue before sending coins. Catalogue money refundable. Worthycoin Corporation, Leaders Numismatic Quotations, K-118-C, Boston 8, Mass.

• • • INDIAN CURIOS, RELICS, ANTIQUES

SPECIAL OFFER. 8 perfect arrowheads $1.00. U. S. only. Arrowhead Sales, 4588 So. Acoma, Englewood, Colo.

6 ARROWHEADS $1.00. GUARANTEED Perfect. Navajo Shop, 687 So. Patton Court, Westwood, Colo.

• • • HOBBIES & COLLECTIONS

GROW GIANT crystals! Send dime for booklet explaining hobby. Crystocraft Co., College Station, Texas.

• • • EDUCATION & INSTRUCTION

COMPLETE YOUR high school at home in spare time with 59-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. XA28, Drexel at 58th, Chicago 37, Ill.

WANTED: MORE new writers for TV-radio, magazines, business and social publications. Learn at home for extra income or exciting full time career. Many students earn while learning. Professional instruction. Send today for free book of opportunities and free typical lesson. Palmer Institute of Authorship, Desk YM-66, 1680 N. Sycamore, Hollywood 28, Calif.

HIGH SCHOOL Diploma At Home. Licensed teachers—approved materials. Southern States Academy, Box 144-LX, Station E, Atlanta, Ga.

BE A Real Estate Broker. Study at home. Write for Free book today. GI Approved. Weaver School of Real Estate, 2018B Grand, Kansas City, Mo.

USED CORRESPONDENCE Courses and Books sold and rented. Money back guarantee. Catalog Free. (Courses bought.) Lee Mountain, Pisgah, Ala.

WANT A Diesel job? New opportunities to increase income. Higher pay. More money. We can help you qualify. Tools. Shop method home training. Write today! Diesel Tractor, Heavy Equipment Division, Interstate Training Service, Dept. B-4, Portland 13, Ore.

BOOKKEEPERS! INCREASE your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 202, Cedar Grove, N. C.

HIGH SCHOOL—No classes. Study at home. Spare time. Diploma awarded. Write for Free catalog HAJ-57. Wayne School, 2527 Sheffield, Chicago 14, Ill.

PHYSICAL THERAPY And Massage. We train you at home. Earn big profits from your own private practice or work with hospitals and doctors. Free catalog. National Institute, Desk 2, 159 East Ontario, Chicago 11.

LEARN MINERALOGY at home. Diploma course. Fortunes now being made in uranium and other minerals. Free catalog. Mineral Science Institute, Desk 17, 159 East Ontario, Chicago 11.

ELECTRIC WIRING, Home study, free catalog. Master Electrician Institute, Box 244, Fitchburg, Mass.

"8 MISTAKES PARENTS Make." Every parent should have this new book about child training. It is free; no obligation. Simply address Parents Association, Dept. 946, Pleasant Hill, Ohio.

EARN DEGREE. Free Bulletin. Home-study only. Midwestern Bible School, 517 Merchants Bank Bldg., Indianapolis.

PIANO TUNING pays. Big money in spare time. Learn at home in 30 days. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. Free catalog. Capital Tuning School, 16 Southwest Second, Fort Lauderdale, Fla.

WANT STRONG, masculine voice? Send for Free booklet. Prefect Voice Institute, 210 South Clinton, Studio 2FU-3, Chicago 6.

ENGINEERING DEGREES earned by home study. American College of Engineering (University of the West), Box 27724 (I), Hollywood 27, Calif.

TATTOOING SUPPLIES, licensed course, illustrated brochures 25¢. Zeis, 728 Leslie, Rockford, Ill.

• • • BOOKS, PERIODICALS

BOOKHUNTERS! ALL Subjects. Send Wants! Jaher Book Service 183-M Hazelwood Drive, Westbury, N. Y.

Invention Clinic

[Continued from page 17]

Fire Alarm

George H. Muffley of Akron, Ohio, has applied for a patent on a fire alarm which produces an explosive sound to warn people in the house when a fire breaks out. He wants to know what we think of it and whether it would set the alarm market on fire.

Answer: Although we completely favor any device which will reduce the danger to persons from fires starting in the home, we are not too much impressed with this device. You will have a problem shipping the explosive charges. Replacement units not within the alarm device will need to be stored and are of themselves dangerous. But the point of greatest objection is that the flame must actually reach the alarm before the thing will respond. This means that the alarm devices will have to be scattered about the premises in great numbers and be positioned in spots where fires are most likely to start. This makes expensive the price for complete protection. It also places the explosive charge in spots where they could harm individuals, or at least scatter burning materials. The best type of alarm is one which will sound when temperatures get to around 140° or 160°F. This is still below flame temperature. Automatic dousing with water or chemical spray, together with an alarm is more effective than an explosive sound, in our opinion.

Acetylene Generator

Robert Seid, Auburn, Neb., sends a diagram for an acetylene gas generator for production of the gas from calcium carbide and its use in a jet engine. Would it generate on the open market?

Answer: There is nothing new here whatever. Your gas generator is not even as good as the old style acetylene gas generators which were found on many old store and farm lighting systems before electricity took over. Some of these installations still are in use. Nor do you show or explain any new application of the gas to a jet engine. Acetylene is not the most efficient of known fuels. Power per pound of fuel, either gas or solid, is a very important consideration. In your design you are always transporting useless slush which fills a tank at the end of the run. Forget it. •

When answering advertisements please mention MECHANIX ILLUSTRATED

DIESEL-AUTO MECHANICS NEEDED
BIG PAY...GOOD FUTURE

If you have no trade or profession that assures you steady employment and top pay through good times or bad, regardless of whether you want to be a mechanic, technician, salesman, executive—or have your own profitable shop—you should investigate NOW this opportunity to enter world-famous Bailey Diesel Schools. Prepare yourself, *this proven way*, for an important place in the vast and ever growing field of Diesel, with TOP PAY . . . ASSURED FUTURE.

Why Gamble With Your Future!

Your future success depends largely on the reputation of the school you attend. Don't take chances! Train at Bailey—America's foremost school of Diesel Training . . . approved for veterans and non-veterans. We help you find part time jobs while in school. Employment after graduation. Return coupon below TODAY for FREE CATALOG that takes you on an amazing Camera Tour of Bailey Class Rooms and Shops.

ACT NOW—MAIL TODAY!

Name_____

Address_____

Town_____ State_____

BAILEY TECH. SCHOOLS
1652 So. Grand Blvd., St. Louis 4, Mo.

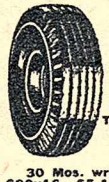
CHEMISTRY

BIG LABORATORY GIVEN FREE!

Be a **CHEMIST!** One of the really **GREAT** professions! We teach you at home. Simplified (but thorough) course; no previous training required. Earn while you learn. This is a **GOLDEN AGE** for those with special knowledge! Diploma awarded! Send 25c for first lesson and KIT or $1.00 for first 5 lessons and supplies including

FREE! **URANIUM TESTER, CHEMICAL PUZZLE** (worth $2.50) and **HOW TO MAKE 100 NEW CHEMICALS!**

NATIONAL SCHOOL OF CHEMISTRY
P. O. Box 609-C • Redwood City, Calif.



WHY PAY MORE!

22 YEARS AT THIS ADDRESS
AN ESTABLISHED POLICY OF CAREFUL SELECTION ASSURES YOU MANY HAPPY MILES. BE WISE—TRY ONE—YOU'LL BUY MORE! WE WELCOME COMPETITION. NO ONE CAN TOUCH OUR QUALITY & PRICE!

PARTIALLY USED TIRES—AND OTHERS TAKE THE 10% DISCOUNT WE OFFER & PUT MONEY IN YOUR POCKET

EVERYBODY MAY TAKE **10% off** ON EVERY TIRE

Free—Tube With Each Passenger Tire

30 Mos. written guarantee				32 Mos. written guarantee			
600x16	$5.16	475x19	$5.36	700x15(6)	$ 9.26	700x20	$12.36
600x16(6)	6.56	640x15	4.86	750x16(8)	11.66	750x20(8)	14.56
650x16	5.56	670x15	5.26	700x17	9.76	750x20(10)	16.76
650x16(6)	7.16	710x15	5.36	750x17	13.06	825x20	19.96
700x16	6.16	760x15	5.86	750x15	10.76	900x20	19.76
750x16(6)	8.36	800x15	6.26	30x5	10.26	1000x20	19.76
550x18	4.66	820x15	6.26	600x20	10.66	1100x20	20.96
550x17	4.66	550x15	5.16	650x20	11.66	1000x22	21.46
650x15	5.06	670x16	5.16	32x6(8)	11.76	1100x22	21.76
700x15	5.26	700x16(6)	9.56	32x6(10)	12.66	1100x24	23.96

ALL WHITE WALLS $1.00 extra (Military Treads)—750x20____12.56
Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. 6. No C.O.D.

STANDARD, 834 North Broad St., Philadelphia 30, Pa.

MI CLASSIFIED ADVERTISEMENTS

RARE MAGAZINES, catalog 10¢. Nationwide Magazine Exchange, Box 1375-M, San Antonio 6, Texas.

OLD, NEW, Rare Books Located. Send wants to Old South Book Service, 24A St. Botolph St., Boston 16, Mass.

• • • RADIO, TELEVISION SUPPLIES & INSTRUCTION

BUILD 16 RADIO Circuits at home, only $19.95 complete. Free Dynamic Radio & Electronics Tester, Set of Tools, Soldering Iron. No experience or additional parts required. A practical Home Radio & Electronics Course. Unconditional Money-Back Guarantee. Order direct or send for descriptive literature. Free valuable Radio, TV & Hi-Fi Repair Manuals on request. Progressive "Edu-Kits" Inc., 497 Union Ave., Room 40F, Brooklyn 11, N. Y.

PROFESSIONAL TV Analysis. Enables you to repair and save $$$. Detailed information useful for life of set. Send Make, Model, Chassis numbers and $2.00. General Specialties, Box 145, North Chicago 1, Ill.

NEW T. V. Tunner—Automatic, remote control of your T. V. picture from anywhere in the room. Easily installed yourself. Fits all T. V. sets. Guaranteed. $24.95 postpaid. U. S. Electric Co., 1404 Rowland Ave., West Covina, Calif.

WHOLESALE. RECORDERS, Tapes, Radios, Phonographs, Catalogue. Towers, Box 155, Philadelphia 5.

• • • MUSICAL INSTRUCTION

SONGS INTO $$$$$$$$—Share $29 million dollars yearly for New Songwriters & songpoets. Songs composed, published, promoted by largest firm. Information, appraisal Free. Send to Nordyke Publishing Co., 6000 Sunset Blvd., Hollywood 28M, Calif.

SONGWRITERS: RECORDING company wants new songs. Royalty basis. National sales, promotion if selected. No charge for melodies. Send material. Music Makers, Dept. B-15, Box 2507, Hollywood, Calif.

SONG POEMS wanted to be set to music. Send poems. McNeil, Master of Music, 510 MI South Alexandria, Los Angeles, Calif.

POEMS WANTED for New Songs. Send Poems. Immediate consideration. Crown Music Company, 1472-M Broadway, New York City 36.

POEMS WANTED for musical setting. Send poems. Free Examination. Five Star Music Masters, 629 Beacon Bldg., Boston, Mass.

SONGWRITERS! SEND poems, songs. Music Service, MI, 243 West 72nd St., New York 23.

SONGWRITERS! YOUR words set to music. Custom recordings available. Satisfaction guaranteed. Mail to Music, Box 18765, Los Angeles 18, Calif.

$100. WORTH OF "Know-How" $1! Imagine! Fun! Fame! Teenagers! Adults! Hurry postcard to: "Write-A-Tune!" (MI), Berkshire V, Sandy Hook, Conn.

SONGPOEMS AND lyrics wanted. Mail to: TinPan Alley, Inc., 1650 Broadway, New York 19, N. Y.

• • • AUTHOR SERVICE

WANT YOUR Book Published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet MX. Vantage, 120 West 31, New York.

WANTED: BOOK MANUSCRIPTS—all subjects considered. Greenwich Book Pub. (Atten. Mr. Zorn.) 489 Fifth Ave., N. Y. C.

• • • CARTOONING

"HOW TO Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 356, Pleasant Hill, Ohio.

• • • CLAIM INVESTIGATOR TRAINING

INVESTIGATE ACCIDENTS — Thousands of insurance companies, airlines, and steamship lines need Claim Investigators. Learn this fascinating work—easily, quickly. Free Book—Now! Universal Schools, Dept. R-6, Box 8202, Dallas 5, Texas.

• • • MAGIC TRICKS, JOKES, PUZZLES

500 TRICKS, DOUGLAS famous 120-page Catalog, only 10¢. Fastest service to magicians for 30 years. Send 10¢ today. Douglas Magicland, Dept. 3, Dallas, Texas.

BEST MAGIC. Joker's novelties. Lower Prices. Catalog 10c. Top Hat, Evanston 14, Ill.

• • • HYPNOTISM

STUDY HYPNOTISM! Amazing illustrated lessons. Big 280-page treatise jam-packed with fascinating information. Simple understandable language you'll enjoy. Full price only $2.95 postpaid—or C.O.D. plus postage. Satisfaction or refund guaranteed. Order "Hypnotism" today. Nelson Company, 210 South Clinton, Dept. 2FU-3, Chicago 6.

THE PSYCHOLOGY Of Hypnotism—Complete Hypnotic Technique $1.00. E. Hester, 55 Giles Ave., Jersey City 6, N. J.

FREE LITERATURE: Hypnotism, Autohypnosis, Mechanical hypnosis. Revealed by scientists. Hypni, Box 6097, Oklahoma City 11, Okla.

MASTER HYPNOTISM in 25 lessons, complete easily learned course in one volume. $1 postpaid in plain wrapper. Satisfaction or dollar refunded. Books Publishing Co., Amityville 4, N. Y.

FREE ILLUSTRATED Hypnotism, Self-hypnosis catalogue. Write: Hypnotist, 1324 Wilshire, Hollywood 17M, California.

• • • VENTRILOQUISM

LEARN VENTRILOQUISM! Get exciting details. Harry Harmon, Jr., Box 33, Mint Spring, Va.

• • • CHALK TALKS

TRICK CHALK Stunts. Catalog 10c. Cartoonist John Balda, Oshkosh, Wis.

• • • GAMES, ENTERTAINMENTS, AMUSEMENTS

PHOTOS FROM romantic, exotic Paris. 4 for $1.00. C. Jones, Box #84, Baltimore 18, Md.

• • • DETECTIVES

DETECTIVE TRAINING. Phillips Secret Service System, 1917-G North Kenneth, Chicago 39, Ill.

DETECTIVES—WORK home—travel. Experience unnecessary. Detective Particulars free. Write, George Wagoner, J-125 West 86th, New York 24.

• • • CAMERAS, EQUIPMENT & PHOTO SUPPLIES

35MM ENLARGER. Large-size plans for the construction of an enlarger expressly designed to be used with miniature negatives are now available for readers of MI. This enlarger uses a single condenser which also serves to hold the negative absolutely flat in the focal plane. For the easy-to-follow drawings, send 50 cents to the MI Reader Plan Service. Fawcett Publications, Inc., Greenwich, Conn. Ask for Plan No. P-4A.

BUY WHOLESALE nationally advertised cameras, photo supplies, thousands other products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-AB, N. Y.

40% OFF NEW Weston II Meter. Terrific savings photo equipment, appliances. Free catalog. Mailers Mart, Box 135-C9, New Rochelle, N. Y.

PHOTOGRAPHY FOR Pleasure or Profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 204A, Chicago 14, Ill.

ATTENTION CAMERA Owners. Can you use several hundred dollars? See Polypix ad in "Moneymaking Opportunities."

• • • MOTION PICTURES & SOUND EQUIPMENT

TAPE RECORDERS, Tape. Unusual values. Free catalog. Dressner 29-02 L, 174 St., Flushing 65, New York.

RECORDERS, TAPES, wholesale prices. Free catalogue. Craston, 215 E. 88 St., New York City 28.

5,000 NEW-USED 8-16MM. Silent-Sound Films. International, Dept. MI, Greenvale, N. Y.

• • • HOME MOVIES

SAVE 50%! GUARANTEED-FRESH color, b&w movie film! 8mm, 16mm. Free catalog! ESO-L, 47th Holly, Kansas City 12, Mo.

• • • AUTO SUPPLIES & EQUIPMENT

ELECTRONIC MIRACLE! Automatically time start, warm motor, anytime, anyplace. Complete plans, $3. Parts available. Electronic Sales, Box 13, Ottawa, Ill.

FREE DISCOUNT catalog—speed, power, custom equipment. Almquist Engineering, Milford 1, Penna.

FREE, ILLUSTRATED, descriptive information "The Truth About Water Injection." Injecto, Box 526, Burbank, Calif.

ELECTROPLATE AUTOPARTS, novelties, mirrors. Easy, inexpensive home processes. Free booklet. Tyco, Box 13231-QA. Houston 19, Texas.

DISCARDED GM71-110 INJECTORS Parts Wanted. Bonus on HV. Packard, 7120 Carnegie, Cleveland 3, Ohio.

• • • AUTOMOBILES & MIDGET CARS

SAVE MONEY on all new 1956 Automobiles. For lower Detroit prices, write to Gunnar Nelson, 15488 Glenwood, Detroit 5, Mich.

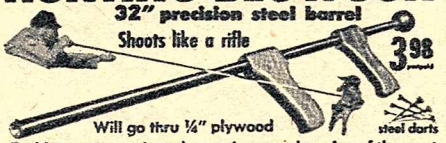
WHAM-O *Amazing new weapon for sportsmen!

HUNTING BLOWGUN

32" precision steel barrel

Shoots like a rifle

3.98



Will go thru ¼" plywood — steel darts

Exciting new sport based on an improved version of the most accurate native weapon ever devised - the hunting blowgun of Borneo! Silent and very powerful - American sportsmen who first try it cannot believe their eyes! Compression of breath in tube gives amazing air power! Shoots over 300 feet. Enjoy target fun with friends. Average person can hit 2" bullseye at 30 ft. Precision made of the finest deep-blued steel 32 in. long. Hardwood grips. Rubber mouthpiece. Beautiful finish. Excellent for destroying varmints. Kills without poison. Comes with target, instructions. Comes with 6 5" steel hunting darts. Extra darts 6 for $1. At dealers or Send to: **WAMO MFG. CO., Box T-82, San Gabriel, Calif.**

Send for FREE catalog on Rifle & Pistol Crossbows, Golf & Baseball Trainers, .22 Match & Dueling Pistols, Pistol BB Guns, Blowguns, Outdoor Games

---

TELEPHONES

DESK STAND STYLE

Slightly used but in excellent condition. Many Valuable Uses. Inter-House Phones, House to Barn, etc., Loud Speakers, Microphones, Educational Purposes, Toys, etc.

Come complete, ready to use with wiring diagrams included. Two complete for only $5.00. **$2.75** Postpaid in U.S.A.

TELEPHONE LAMP KIT—with illustrated instructions for making Desk Telephone Lamp including all parts (harp, nipples, push switch, cord, plug, etc.) . . . $6.50 Ppd. (Shade is not included.)

MICROPHONE, Dept. X-3405
1760 W. Lunt Ave., Chicago 26, Ill.

BUY IT

WHOLESALE!

GET UP TO 40% OFF

☆ Start a Buying Service at Home, SPARETIME. GET BIG-NAME MERCHANDISE FOR SELF AND CLIENTS UP TO 40% LESS THAN REG. PRICE. SALES EASY, AS YOU CAN GIVE SIZEABLE DISCOUNTS, STILL MAKE FAT COMMISSIONS. *Post Card brings FREE COPY "The Wholesale Plan."*

FREE! "THE WHOLESALE PLAN"

American Buyers Service

HERTEL STATION, DEPT. MI, BUFFALO 16, N. Y.

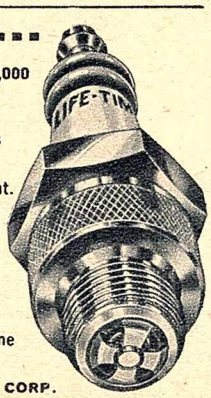
PLAY RIGHT AWAY!

Even If You Don't Know a Note of Music Now

Now it's EASY to learn any instrument. No boring exercises. Start playing real pieces by notes right away. Amazing progress, at home, in spare time. No teacher. Few cents per lesson. 900,000 students! Write for FREE BOOK. No obligation. **U. S. School of Music, Studio 226, Port Washington, N. Y.** *(Our 58th successful year!)*

---

we're sorry...

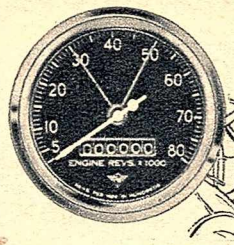


that we have not had the production to supply all the demand for **Life-Time 50,000 Mile Spark Plugs.** New equipment and greatly accelerated production enable us now to make immediate delivery. If you have ordered and your check has been returned, please place your order again. **Life-Time Spark Plug Sets** may be ordered from this advertisement. We will postpay at regular retail price. Specify make, model and year of car. **Set of 6, $7.14; set of 8, $9.52.**

DISTRIBUTORSHIPS

Some additional distributorships are now available. If you have already written us regarding your area, please contact us again. If you have not written before, please send us an outline of your previous business experience and qualifications.

CONTINENTAL MANUFACTURING CORP.
Washington Blvd. at Motor Ave. — Culver City 144, California



DEPENDABLE!

ELECTRIC TACHOMETERS

by Stewart-Warner

Full line! Fills every need. Models for cars, trucks, buses, boats, stationary engines.

Accurate! Positive electric drive assures accurate speed indications.

Reliable! Vibration-proof . . . no flexible shafts, no oscillators.

Easy to read! Large 3" diameter, illuminated dial face. Pointer has full 270° travel.

Exclusive! The only electric tachometer with an odometer. Records total engine revolutions.

See your dealer or write:

STEWART-WARNER

Instrument Division

Dept. V-66, 1840 Diversey Parkway, Chicago 14, Illinois

EARN *Big Money!*

TELEVISION
ELECTRONICS
RADIO-RADAR

Learn TV, Radio Servicing, Radar, Sonar, Electronics at home in your spare time by Christy Shop-Method Home Training. Covers all subjects. The **only** complete course. Repair television and radio sets of friends and neighbors. Service electronic equipment in factories, stores, hospitals. Earnings made while learning can pay for your training. **19 TRAINING INSTRUMENTS INCLUDED!** Learn by Doing. Rush name for FREE Book and FREE Sample Lessons.

CHRISTY TRADES SCHOOL
4804 N. Kedzie, Dept. T-2102 — Chicago 25

High School at Home

MANY FINISH IN 2 YEARS

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 59-year-old school. Send for FREE descriptive booklet.

AMERICAN SCHOOL, Dept. HA28
Drexel at 58th St., Chicago 37, Ill.
Without obligation, please send FREE descriptive booklet.

Name .....

Address .....

Complete Canadian Courses available. Write American School, Dept. HA28, 1610 Sherbrooke St. W., Montreal.

MI CLASSIFIED ADVERTISEMENTS

HUNDREDS OF automobile catalogs—American, antique, foreign; dealer books, glossy photographs, shop manuals; free motor magazines—offered by non-profit club. Write immediately; get on free mailing list. Auto Maniacs 2, Stockbridge, Mich.

MAGAZINE ABOUT antique automobiles. Send for free sample copy. Franson's Motor News, Box 254, Eugene, Ore.

MI SPORTSER. Why envy the owner of a snazzy sports car? Build one yourself with these complete instructions and plans for less than $500. To get your copy, send $3.00 to MECHANIX ILLUSTRATED Plans Service, Greenwich, Conn. Specify Plan No. JH-19.

• • • MOTORCYCLES, BICYCLES MOTOR SCOOTERS

DOODLEBUG MOTORSCOOTER $15; Whizzer $14; Servicycle $20; Salsbury $40; Crosley Convertible $25; Outboard motorboat engine $5. (Mailorder Only.) Send 25¢ (35¢ for first class mailing) for Directory-Catalogue Number 71, listing these and hundreds of other bargains in homebuilders parts, plans, etc. Midget Motors Directory, Athens, Ohio.

RECONDITIONED MOTORCYCLES and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 27, Mo.

MOTORSCOOTER PARTS—Send 25¢ for list. Give make & model of scooter. MotorScooter Parts Co., Dept. M6, Box 7211, Indianapolis 1, Ind.

• • • AVIATION

"THE SMALL Helicopter" Theory and Guide Manual. Drawings. Construction Data. Build your own. $4.00. Sandhill Aircraft, Box 315, O'Neill, Nebr.

PROPELLERS, PLANS, kits for snow sleighs, air boats, catalog 25c. Banks-Maxwell, Box 3301-D, Ft. Worth, Texas.

POWER HAMMER! Sheet metal cutter. Circular on plans. Rush name. Maupin, Tipp City 8, Ohio.

• • • ELECTRICITY & ELECTRICAL SUPPLIES

ELECTROPLATING EQUIPMENT, Anodes and Solutions for all types of plating. Instructions. Assemble your own plater and save. Free catalog. Ramyr, Dept. E-6, 1624 East First Street, Los Angeles 33, Calif.

LAMPS—PARTS catalog containing wiring instructions 25¢. Gyro Lamps, 5402M Clark St., Chicago 40.

• • • MACHINERY, TOOLS & SUPPLIES

"SPEEDY" DRILL Grinding Guide. Order from ad on page 182.

• • • WELDING, PLATING & SOLDERING

PERFECT FLAME burning with Amazing Neeco torch guides. Free illustrated folder. New Era Eng. Co., 458 W. 29th Street, Chicago 16, Ill.

WELDERS, 110/220, WELDS ½", $39.50. Morris, 1070 Inner Drive, Schenectady 3, N. Y.

• • • INVENTIONS WANTED

INVENTIONS PROMOTED. Write for free booklet "Your Invention." Kessler Corporation, 661W, Fremont, Ohio.

INVENTORS: HUNDREDS of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 50-C, 631 E Street N. W., Washington 8, D. C.

INVENTIONS WANTED. Patented; unpatented. Tremendous manufacturers lists. Global Marketing Service, 2420 77th, Oakland 5, Calif.

AMERICAN CONGRESS Of Inventors—quick response, free "Edison Formula for Success." Inventors, Box 1481 Milwaukee 1, Wisc.

INVENTIONS WANTED: Patented or Patent Pending. 25 years' experience Promoting Inventions. National Service Bureau, 3126 Meramec, St. Louis 18, Mo.

SUPERIOR PROMOTIONS. Patented; unpatented inventions. New, informative booklet upon request. Superior, 340-344 North Rodeo, Beverly Hills, Calif.

CASH BUYERS for ideas and inventions. Write National Inventors Institute, 457 Munsey Building, Washington 4, D. C., or 4900 Euclid Ave., Cleveland 3, Ohio.

HAVE CAPITAL to invest in new ideas or patented inventions. Room 604, Telegraph Bldg., Harrisburg, Penna.

• • • FOR INVENTORS

INVENTORS—IF you believe you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson with offices in Washington, D. C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 138-K Victor Building, Washington 1, D. C.

INVENTORS—SEND for free patent information book and inventor's record. Registered Patent Attorney, Associate Examiner, Patent Office 1922-29; Patent Attorney & Advisor, Navy Department 1930-47. Gustave Miller, 66M11 Warner Building, Washington 4, D. C.

SEARCHES—PUT your patent searches in the hands of a Registered Patent Attorney or Agent, as he qualifies to give a worth-while patentability report. Record of Invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 925 Columbian Building, Washington 1, D. C.

PATENT SEARCHES, including copies of nearest patents, $6.00. Reports airmailed within 48 hours. More than 100 registered patent attorneys use my service. For Free invention protection forms, write Miss Ann Hastings, P. O. Box 176, Washington 4, D. C.

INVENTORS: NEED Help? Write Institute of American Inventors. Dept. 50T, 631 E St., N. W., Washington 4, D. C.

INVENTORS: LEARN how you can protect your invention. A specially prepared booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the United States Patent Office and are prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 63A-D District National Building, Washington, D. C.

INVENTION RECORD form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTIONS AND patents promoted. A-1 service for inventors for many years. Write Adam Fisher Co., 5418 Idaho, St. Louis, Mo.

PATENT SEARCHES $5.00. 48-hour service. Free invention protection forms. Write Raymond L. Smith, Patent Searcher, 620 Sheraton Building, Washington 5, D. C.

"INVENTOR'S GUIDE" and "Record of Invention" free on request. Frank M. Ledermann, 154 Nassau Street, New York 38, N. Y.

UNPATENTABLE IDEAS can be protected. Literature free. Technical Services, #282 Woodcliff Station, North Bergen, N. J.

INVENTORS—SEND today for instructive booklet "Patent Protection for Inventors" giving detailed patent information and outlining preliminary steps to take toward patent protection — also "Evidence of Invention" form. Victor J. Evans & Co., 270-G Merlin Building, Washington 6, D. C.

INVENTORS I can save you money. Write Box 5991, Sta. D, Columbus 22, Ohio.

• • • PATENT ATTORNEYS

INVENTORS: LEARN how you can protect your invention. A specially prepared booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the United States Patent Office and are prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 63B-D District National Building, Washington, D. C.

INVENTORS: WHEN you are satisfied that you have invented something of value write me without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers, Registered Patent Atty., 924 Columbian Bldg., Washington 1, D. C.

INVENTORS—THIS firm is registered to practice before the United States Patent Office and available to assist you in the preparation and prosecution of your patent application. "Patent Protection for Inventors" booklet containing detailed information and steps to take toward patent protection sent promptly upon request. No obligation. Victor J. Evans & Co., 271-G Merlin Building, Washington 6, D. C.

INVENTORS—IF you believe you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson with offices in Washington, D. C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 138-L Victor Building, Washington 1, D. C.

"INVENTOR'S GUIDE" and "Record of Invention" free on request. Frank M. Ledermann, Registered Patent Attorney, 154 Nassau Street, New York City 38.

Speaking of Jobs...

The Leak Hunter

A LEAK HUNTER, as you may well imagine, is a man who searches for leaks. In this case, at the Brown-Forman Distillers Corporation in Louisville, Ky.

Armed with a flashlight, pointed chisel and a small hammer, the leak hunters inspect the company's ricked barrels of golden amber for seepage, warped heads, split staves, etc. Working as a team, the leak hunters check each barrel to make sure it is tight. If a leak is found, the hole is enlarged slightly with the pointed chisel and a small cedar peg is inserted with the hammer. Barrels that cannot be repaired in the warehouse are marked with chalk and removed to the recooperage room for major repairs. A soul-satisfying task but sipping is not allowed on the job. •

(Photo courtesy Licensed Beverage Industries.)

Speedy Sprayer

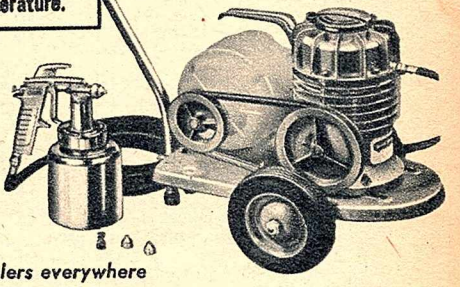
mobile paint sprayer

Choice of craftsmen for 35 years! Saves time, paint and money. Quickly gives flawless finish to walls, furniture, screens, fences and handiwork. Sprays all materials; ¼ H.P. motor. Diaphragm principle assures clean, oil-free air. Never needs lubrication. With gun, less motor.

No. 890 Speedy Sprayer $38.50

Add wheels with Wheel Kit No. 909. Includes 6" wheels, handle, fittings. $6.95

FREE! Write for "How to Spray" Booklet and Literature.



At dealers everywhere

W. R. BROWN CORPORATION
2659 N. NORMANDY AVE., CHICAGO 35, ILLINOIS

MORE POWER MILEAGE SPEED

GUARANTEED TOP CAR PERFORMANCE FOR AT LEAST 15000 MILES WITH EACH TREATMENT

INCREASE COMPRESSION PICK UP

STOP BURNING OIL

SAVE $75 ON OVERHAUL, DO IT YOURSELF IN 15 MINUTES

Just put our AUTO LIFE into your engine. It instantly goes to work to put a metal film around the rings and cylinder walls. With just 15 minutes of your time you have the equivalent of an expensive overhaul, for the fraction of the cost. It's so easy, anyone can do it. Nothing else to buy. SEND NO MONEY. We will send you AUTO LIFE C.O.D. plus postage. Or send $3.95 NOW and receive it postpaid. If after trying AUTO LIFE for 30 days, your car doesn't STOP OIL BURNING, GET MORE PEP, BETTER GAS MILEAGE and are not completely satisfied, we will immediately refund your money.

AUTO CHEMICAL LIFE IND., Dept. G-3, 230 Division St., N.Y. 2, N.Y.

INSURED TIRE SERVICE
POPULAR BRANDS

SPECIAL! Deduct 10% on orders for Two or More used tires

FREE INSURANCE POLICY given with each used tire sold. We guarantee the amount of service you pay for.

NOWHERE CAN SUCH QUALITY BE FOUND AT SUCH LOW PRICE!

YOU CAN'T LOSE!!

Super Quality—Rugged			Performance—12 Months Insured Service		
600x16	$3.65	670x15	$3.95	700x16	$4.45
650x15	3.85	670x16	4.05	710x15	4.35
650x16	4.25	700x15	3.95	760x15	4.45

760x16	$4.75	820x15	4.95	550x17	4.65	600x16	$5.25
800x15	4.75	820x20	5.25	600x17	5.25	650x16	5.75
800x16	4.95	825x20	5.45	650x17	5.45	700x16	6.35
900x20	10.95	1000x20	11.25	1000x20	20.45		

Supreme Quality—Nothing Finer—18 Months Insured Service							
600x16	$5.25	475x19	$5.45	700x15(6)	$10.45	700x20	$12.50
600x16(6)	6.75	640x15	4.95	750x16(8)	15.95	750x20(8)	15.50
650x16	5.75	670x15	5.35	700x17	11.95	750x20(10)	17.50
650x16(6)	7.25	710x15	5.45	750x17	16.45	825x20	21.50
700x16	6.35	760x15	5.95	750x15	10.95	900x20	19.95
750x16(6)	8.45	800x15	6.25	30x5	11.25	1000x20	20.45
550x16	4.95	820x15	6.35	600x20	10.95	1100x20	21.25
550x17	4.75	550x15	5.35	650x20	11.75	1000x22	21.95
650x15	5.25	670x16	5.15	32x6(8)	11.95	1100x22	22.75
700x15	5.35	700x16(6)	10.25	32x6(10)	12.75	1100x24	25.95

Whitewalls $1.00 extra.

MIDLAND TIRE SALES

Speedy shipments on Mail Orders. F.O.B. Chicago. Insurance policy sent with each order. Deduct 10% on orders for 2 or more used tires. Send CHECK or MONEY ORDER.—No COD's. 3701 S. Normal, Dept. ME-35, Chicago 9, Ill.

MI CLASSIFIED ADVERTISEMENTS

INVENTION RECORD form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: INFORMATION on patent procedure furnished on request, without obligation. John Randolph, Registered Patent Attorney, 210 Columbian Building, Washington 1, D. C.

C. A. SNOW & CO., 1-427 Snow Bldg., Washington 1, D. C. Registered patent attorneys. Literature mailed on request.

• • • BUILD IT YOURSELF

AIR CONDITIONERS—Home, Automobile. See Kool Engineering ad page 24.

• • • HAND MADE NOVELTIES

FREE "DO-IT-YOURSELF" Leathercraft Catalog. Tandy Leather Company, Box 791-Z15, Fort Worth, Texas.

• • • HOME CRAFTSMEN

LEATHERCRAFT, METAL enameling, beadcraft, shellcraft, metal tooling, textile painting, many other crafts. Free big illustrated catalog. Kit Kraft, Dept. 937, Studio City 1, Calif.

FREE. COMPLETE illustrated catalog, Leathercraft kits, supplies. Also big Metalcraft catalog. Write now for either or both. J. C. Larson Co., Dept. 5851, 820 S. Tripp, Chicago 24.

KNOCK DOWN cedar chest. Free Price List. Giles & Kendall Co., Brownsboro, Ala.

WOODWORKING FOR home craftsmen. Twenty-two manuals. Over 1,000 pages, 75 training projects. Only complete home training program available. Carefully written, profusely illustrated. Covers everything in cabinet making from wood selection to final finishing. Complete instruction in care and use of all hand and power tools. Prepared by manual training instructors. Write for free booklet. Interstate Training Service, Dept. G-4, Portland 13, Ore.

28 LAWN ORNAMENT Patterns 25¢. Other patterns 15-20" high. Dutch boy, girl, pirate, bull terrier, Mexican boy, girl, dwarf, penguin, flower girl, 15¢ each. 25 novelty patterns 30¢. All 62 full sized patterns $1.00. Strother, Box 128-4X, Belington, W. Va. 10¢ postage.

BUY WHOLESALE nationally advertised power, hand tools, thousands other products at big discounts. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-BC, N. Y.

PATTERNS. BUCK Deer 28" high and 30 lawn ornaments, colors indicated. $1.00 postpaid. Lincoln's Studio, Columbia, Conn.

WOODWORKING COURSE for home craftsmen. Twenty-two manuals. Over 1,000 pages. 75 training projects. Only complete home training program available today. Carefully written, profusely illustrated. Covers everything from wood selection to final finishing. Complete instruction in care and use of all hand and power tools. Prepared by expert manual training instructors. Write for free booklet. Interstate Training Service, Dept. D-4, Portland 13, Ore.

WOODCRAFTERS—WE buy what you make from our patterns, easy to make, no special tools needed. Send $1 for patterns and complete instructions. Satisfaction guaranteed. Wm. Rice, 188 Pine St., Kingston 31, N. Y.

• • • FOR THE HOME

FOAM RUBBER Furniture Cushions—Factory seconds 50% discount. Free catalogue. Perma-Foam, 429-B Central Ave., East Orange, N. J.

INSECTS ARE coming; average homes summer's protection $2.00. Free literature. Salesmen invited. 400 10th, Watertown, Wisc.

• • • PLASTICS

PLASTICS HOME-CRAFT course for Men and Women. Tells and shows how to make hundreds of fast selling plastics products. All plastics and materials for 3 projects included in course. No special tools needed. Course pays for itself. Write for Free booklet. Interstate Training Service, Dept. D-4, Portland 13, Ore.

NEW LIQUID casting plastic, clear, colors. Embed real flowers, insects, photos, coins. Saw, drill, carve. Send 25c for handbook, "How to Cast with Liquid Plastic" and proved success plan showing how to make money at home. Castolite, Dept. G-104, Woodstock, Ill.

• • • MODELS & MODEL SUPPLIES

BALSA WOOD, Model Aircraft. 40 page catalog, 10c. Sig Co., Montezuma, Iowa.

STOP KICKING YOURSELF...

because you forgot to buy MI at the newsstand last month ...and missed the "best piece McCahill ever wrote"...or some other wonderful feature or how-to article. Don't miss any more great issues of your favorite magazine. Send yourself a subscription—right NOW!

DON'T DELAY ORDER MI TODAY

Please enter my subscription to MECHANIX ILLUSTRATED

☐ **ONE YEAR: $3.00***

☐ **TWO YEARS: $5.00***

☐ New Order ☐ Re-Order

*In the U.S., possessions and Canada. All other countries $6.00 per year.

NAME..... ADDRESS.....

CITY..... ZONE..... STATE .....

Mail to: MECHANIX ILLUSTRATED, Circulation Dept., Fawcett Building, Greenwich, Connecticut

PATENTS GRANTED

BIGGER and better heads on beer are in store for guzzlers with the use of a beer foam stabilizer invented by Miles A. Weaver of Ithaca and George K. Greminger, Jr., of Midland, Mich. The heady concoction was awarded patent number 2,712,500. Rights were assigned to Dow Chemical Corp. of Midland.

For Izaak Waltons who get up in the wee hours of the morning and go off into the hills to fish, Frank E. Wallman, South Walpole, Mass., has invented a flashlight attachment that can be put on a fishing reel. The device was awarded patent number 2,712,057.

A disposable, plastic ball beverage container with a built-in straw received patent number 2,713,543 for its inventor, Leo Peters of Evanston, Ill. In drinking the contents the plastic ball is squeezed and the liquid is drawn up through the straw.

Cries of outraged neighbors can be quieted with an invention that permits a housewife to clean her dust mop indoors, thus elminating the possibility of soiling clothes hanging on the line. Invented by Lloyd G. Copeman, Metamora, Mich., the dust mop cleaner was awarded patent number 2,712,666.

On-the-spot interviews can be recorded with a pocket-size wire recorder that requires no outside source of power. Powered by two dry cells and two miniature B batteries, it was invented by Louis A. McNabb, Davenport, Iowa. The recorder was given patent number 2,713,618.

A recipe for pure fresh cocoanut juice is contained in an invention that won for Ramon Lopez-Irizarry of San Juan, Puerto Rico, patent number 2,712,502. Senor Lopez claims the cocoanut flavoring extract makes a wonderful base when it is used for carbonated drinks.

A headphone that buzzes when driver's head nods and prevents the user "from falling into a deep sleep at a time of danger," was granted patent number 2,713,159 for its inventor, Warren E. Morrison, Minneapolis, Minn. •

WAR SURPLUS AND OTHER BARGAINS SAVE UP TO 90%

HELIOS MAUSER-TYPE CALIPER
All hardened 1/128"-1/1000". Has expanded vernier scale for quicker, easier reading. Knurled thumb slide lock. Inside & outside measurements start from zero. Decimal equivalent embossed on reverse side of caliper. Comes complete with depth gauge slide extension. NEW. A $49.75 value. Limited quantity—$12.95 with leather case.

MICROMETERS Chrome plated, precision engineered, carefully tooled to give long life. All new 0-1" cap. $2.25 ea., 1-2" cap. $3.50.

ARC WELDER KIT $24.95—build your own
Complete make-up package consisting of 1 Aircraft DC Generator. Electric Auto-Lite. 200-250 Amps. 24 Volt. RPM from 2600 up. 1 Rheostat. 1 Giant Toggle Switch. 1 Ammeter, 1 Shunt, 0 to 240 Amps. 1 Voltmeter, 0 to 30 Volts. 1 Electrode Holder. Wiring diagram chart showing conversion of Aircraft Generator to Arc Welder. Shpg. Wt. under 100 lbs. Approx. GOV'T. COST $475. Buy of a lifetime. Like new, perfect. $24.95.
D.C. Generator—same as above, if purchased separately: $12.50.

SENSITIVE C-12 ALTIMETER Famous Air Force Type C-12. 50,000 ft. barometric type. Never before available in surplus. Kollsman patents. Same as instrument used on late aircraft. Graduated in 20' increments. Extremely sensitive, accurate. Limited quantity available. Tested in our lab, guaranteed perfect. $19.95 ppd in USA.

NEW! 1956 CATALOG Largest ever . . . just out . . . new low prices. Send 25c for your copy today. Prices F.O.B. Culver City unless otherwise stated. Check, cash or money order. 25% deposit for C.O.D.

AIRBORNE SALES CO., INC. DEPT. M1656
8501 Stellar Drive, Culver City, Calif.

AUTO MECHANICS EARN AS YOU LEARN AT HOME

BIG PAY! SEND FOR 2 NEW FREE BOOKS

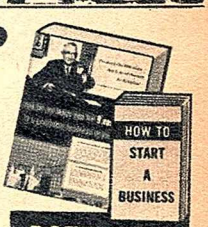
Learn the No. 1 trade—get into America's largest industry. Earn up to $125 a week and more. Enjoy security—thousands of mechanics needed to service 50 million cars and 10 million trucks. New CTI Home Training prepares you in just a few months. Tools and Tune-Up Kit sent.
COMMERCIAL TRADES INSTITUTE Dept. A-303
1400 Greenleaf Avenue Chicago 26, Illinois

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. ½c material makes regular 10c store sellers. Rubber molds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our free booklet will interest and benefit you.
PLASTEX INDUSTRIES, DEPT. 3
3400 THIRD AVE., NEW YORK 56, N. Y.

"How to Go into Business for YOURSELF"

If you know a trade or occupation—why not go into business for yourself? Why not make the profits others are now making?



BOTH FREE! Rush Name on Postcard Today!

IT'S EASY TO START A NEW BUSINESS. It's easier than you think—once you learn the 9 easy steps of building a new business of your own. National Business Consultants has shown over 5000 others how to be successful—let us show YOU too. We guide you every step of the way with sound, proved simple business practices. EXPAND YOUR OWN BUSINESS. Learn our tested, profit-making methods for business success. If you already own a business, let N.B.C. guide you too. You'll be amazed. SEND FOR FREE BOOKLET TODAY! "How to Start a Business" is jam-packed with revealing information. In easy-to-understand language it explains how to start and make any kind of business profitable. Free for the asking! Sent to you in confidential plain envelope. *Just write:*
NATIONAL BUSINESS CONSULTANTS, Office M-6 Los Angeles 61, Calif.

MI CLASSIFIED ADVERTISEMENTS

VTO. YOU can build a flying model of this most revolutionary of all aircraft—a plane that takes off vertically. Send 50¢ for full-scale plans, plus instructions, to MI Reader Plan Service, Fawcett Place, Greenwich, Conn. Please specify VTO, Plan No. M-236.

SHIP MODELS. Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. Illustrated catalog 30¢. James Bliss & Co., Inc., Dept. MI, 342 Atlantic Ave., Boston, Mass.

• • • FOR SPORTSMEN

FISHERMEN KNOW that red-color minnows get more bass! You can have live red minnows handy, without fuss. Send $1.00 for information. Homesteaders Agency, Box 247, Mankato, Minn.

SAMPLE: 25¢ COPY of "The Archers' Magazine." Send 10¢: 1200 Walnut Street, Philadelphia 7, Penna.

• • • SPORTING GOODS

CAMPING EQUIPMENT, Tents (Direct from manufacturer). World's largest selection. Send 15¢ for 120 page 1956 tent & camping equipment catalogue-handbook. Morsan Tents, 10-21H 50th Avenue, Long Island City 1, N. Y.

5,000 BARGAINS, FIREARMS, binoculars, war relics. Catalog 50c. Smith Armory, Runnemede, N. J.

JAP ALTERING to American shells $6.00. Jap shells $3.75. Catalogue .05, T P Shop, West Branch 7, Mich.

SINKER MOLDS—For making your own sinkers. Free illustrated booklet. Reading Instrument Co., Box MI-78, Reading, Penna.

MANY MODERN, Antique Guns. List 10c coin. Ed Howe, 28 Main, Coopers Mills, Maine.

• • • BOATS, OUTBOARD MOTORS

FULL SIZE, cut-to-shape Boat Patterns, Blueprints, 7½-38 feet. New 1956 illustrated "Build A Boat" catalog of 50 naval architect-designed Cruisers, Runabouts, Sloops, Skiffs, Outboard Boats, Sailing, Racing, Houseboats, 50c. Small Boat Hardware Catalog, $1.50. 1956 "How to Build a Boat" Booklet, $2.50. Cleveland Boat Blueprint Co., Dept. A-23, Box 1651, Cleveland 4, Ohio.

FIBERGLAS, BEST prices, best quality, complete stock, 14' kit $29.95. Free Catalog. Superior Fiberglas Process, 11245 Pardee, Inkster, Mich.

MARINE CONVERSIONS for Ford and Jeep engines. Catalog 25c. Lehman Manufacturing Company, 972C Broad Street, Newark 2, N. J.

BUY WHOLESALE nationally advertised outboards, thousands other products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-CD, N. Y.

BOAT PLANS, patterns, frame kits for modern power boats 11'-22'. Get the newest catalog 50¢ or state specific requirements. Designs, Box 568, Compton, Calif.

FREE CATALOG! Boat Kits, Trailers, Fiberglas, Marine Hardware. Luger Industries, Dept. P-6, 4452 Nicollet, Minneapolis, Minn.

FIBERGLAS PERMANENT boat waterproofing. Special 25% Spring Discount. Complete kits, $9.45 up. Guaranteed materials. Easy application. Full instructions. Free literature. Ajax Plastics, Dept. H, P. O. Box 1323, Fort Worth, Texas.

FIBERGLASS, TOP marine grade, yard or kit. Ontario Fiberglass Co., Box 70, Ontario, N. Y.

NEW, USED, rebuilt marine motors. Marine conversions, fittings. Free catalog. Stokes Marine Supply, Dept. 21, Coldwater, Mich.

32 SAILBOAT PLANS. Catalog 20¢, Powerboat Catalog 50¢, Boat Kit Catalog 15¢. Marinecraft, Box 161-X, Brighton, Mass.

CATAMARAN. A novel bipod mast is one of the outstanding features of King Kat, a 12-foot, all-plywood cat. The easy-to-follow-plans include large-scale drawings and full instructions for the amateur boatbuilder. Send $3.00 to MI Reader Plan Service, Fawcett Place, Greenwich, Conn., and specify Plan No. B-230, King Kat.

• • • BINOCULARS, TELESCOPES, MICROSCOPES

SAVE 25%! AMERICA'S largest selection. Free 56 page 1956 Binocular Catalog. $3.95 to $250.00! United, 9043 S. Western, A-2373, Chicago 20. Dealers Wanted.

WAR SURPLUS Bargains: Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market place! Send only $1.00 for beginner's 10-lens Kit and big instruction booklet Stock 2-CB. Write for Catalog CB, Free! Edmund Scientific Corp., Barrington, N. J.

BUILD YOUR own Reflector Telescope complete Kit: Mirrors, Eyepieces, Tripod, all other Accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KM 18, Hartford, Conn.

ESCOPE—REFLECTOR Telescope using standard 1¼ Eye pieces to 216X-7X Finders. Calibrated Mountings $39.50-$59.50 ready to use. Free Booklet. Esco Products, Oakridge, N. J. Sales Showroom, 166 Church St., N. Y. C.

TELESCOPE KITS—Accessories. Mirrors aluminized, corrected and ground to order. Free catalog. Instructions 10c. Garth Optical, G.P.O. 991, Springfield, Mass.

"FREE" CATALOGUE! Thousand war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 lens Hobbyist Set and Project booklet. R. Jaegers, 691 West Merrick Road, Lynbrook, N. Y.

TRIPOD PLANS. Unless you have a sturdy support for your telescope it will be virtually useless for good observing. For best results build MI's "Quarter-Ton" Tripod. Send 75c for plans and instructions to MI Reader Plan Service, Fawcett Place, Greenwich, Conn. Please ask for Plan No. P-7.

REFLECTING TELESCOPES, 60X completely assembled $29.75. Guaranteed observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

400X TELESCOPE MAKERS kit contains brass focusing tube, erector, 5 lenses and instructions—$3.75. Suffolk Science, Mattituck 6, N. Y.

DYNASCOPE — SENSATIONAL New Reflector Telescope. Send for details. Criterion Co., Dept. DM 24, Hartford, Conn.

LOWEST PRICES all sizes Binoculars, Microscopes, Telescopes, catalog. Joe's Company, 4827 Second, Detroit 1, Mich.

MICROSCOPE CATALOG Free. Research Scientific Supplies, 60 Wall St., N. Y. 5.

• • • BODY BUILDING—ATHLETIC EQUIPMENT

BARBELLS, FREE Booklet, Health, Strength, Physique. Reading Barbell Co., Box 455, Reading, Penna.

BARBELLS, EXERCISE equipment. Courses. Free booklet. Good Barbell Co., Reading, Penna.

100 TRICK KNOCKOUTS for self-defense. $1—1¢ each. Priest, Box 251, Evanston, Ill.

• • • REAL ESTATE, FARM LANDS

CALIFORNIA RANCHES $50 down. Huge investment profits. Future or immediate occupancy. Plenty jobs nearby. Free catalog. Pioneer Ranches, Inc., 7419-H Beverly Blvd., Los Angeles 36, Calif.

SAVE HUNDREDS of dollars when selling your real estate. For particulars, write Norman Realty, 80 Lovell Street, Worcester, Mass.

• • • PLANTS, SHRUBS & TREES

$5,199.90 WAS PAID to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 185, 2954 Admiral Way, Seattle, Wash.

• • • HORSE TRAINING

"HOW TO Break And Train Horses"—A book every farmer and horseman should have. It is free; no obligation. Simply address Beery School of Horsemanship, Dept. 1156, Pleasant Hill, Ohio.

• • • RABBITS—HAMSTERS

RAISE RABBITS Successfully By Knowing Facts. 48 page illustrated book describing 25 Breeds, Housing, Feeding, Breeding, Marketing, etc. Plus Bulletin. 25 cents. American Rabbit Association, 83 Arba Building, Pittsburgh, Penna.

MAKE AMAZING profits raising Chinchillas for us. Write for free information. Keeney Brothers, New Freedom, Penna.

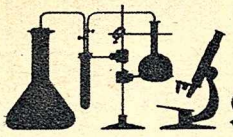
• • • ANIMAL BREEDING

RAISE PHEASANTS on $100 week plan. Little capital and space can make you independent. Free details. Great Central System, Columbus 16, Kans.

• • • PERSONAL

LOANS BY Mail. Borrow $50 to $500. Employed men and women, over 25, eligible. Confidential—no co-signers—no inquiries of employers or friends. Repay in monthly payments to fit your income. Supervised by State of Nebraska. Loan application sent free in plain envelope. Give occupation. American Loan Plan, City National Bldg., Dept. MI-6, Omaha, Nebr.

THE COURIER! Sample of this fast growing mailorder publication for stamp! Courier, 910 Marion, Pharr 6, Texas.



SCIENCE SHORTIES

IF YOU need a funnel and none is available, try shaping one from tin foil.

Pentagon has over 17 miles of corridors, gross floor space of 6,500,000 square feet.

Farm production per man-hour is 2.4 times greater today than in 1920.

Uranium is a soft metal, about two-and-one-half times as heavy as steel.

Record average of 224 tin cans per person was made in U. S. in 1954.

Largest city in U. S. with no fatal auto accidents in 1954 was Sioux Falls, S. D.

Over 400 hand soldered connections have been eliminated in a TV set via automation.

Hawaiian Islands with 492,000 population utilizes 132,822 telephones.

Accidents kill 14,000 to 15,000 farm residents a year, injure more than 1,200,000.

Major U. S. auto firm claims it can produce cars at present 700,000 yearly rate for over three years, never make two alike.

Color TV facilities are available in every state, except Idaho and Montana.

Toll roads in operation at the end of 1954 totaled 1,451 miles.

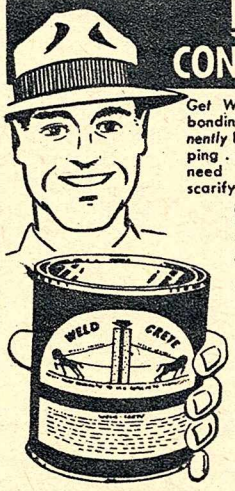
Changes in tin and lead content can be used to date illegible, ancient Greek coins.

Volcanoes are one of few ways scientists have to study earth's turbulent interior.

If one spark plug in V-8 engine car is not functioning correctly, gasoline mileage may fall off as much as 14 per cent.

More than 100 different chemicals play part in manufacture of modern ammunition. •

Easy Way To Make PERMANENT CONCRETE REPAIRS



Get Weld-Crete®. . . the amazing, liquid bonding agent which enables you to *permanently* bond new concrete . . . or cement topping . . . *directly* to old concrete. Eliminates need for chipping, drilling, roughening, scarifying of old concrete base. Ideal for *permanently* repairing concrete floors, steps, walls, driveways, curbings, sidewalks, ceilings. Weld-Crete also *permanently* bonds new concrete directly to brick, wood, masonite, gypsum board, concrete block, metal, ceramic tile . . . even glass! Job-proved for over 8 years. Specified by leading architects and contractors because they know a Weld-Crete bond is ageless . . . *never lets go!* *Tensile* strength over 660 lbs. per sq. inch. *Shear* strength about 400 lbs. per sq. inch. Apply to old surface with brush or spray gun. Then finish off with new concrete or cement topping. Covers 250-400 sq. ft. per gallon depending on surface conditions.

If your building supply or hardware dealer doesn't have Weld-Crete, write for literature . . . or send check or money order for "Get Acquainted" Trial Quart. Only $3.49 postage prepaid. Address Larsen Products Corporation, 4938 Elm St., Bethesda, Md.

EARN $1000 MONTH

TOOL AND DIE DESIGNERS ARE IN DEMAND—and Acme is the *only* school in America offering *complete* tool and die design training—Acme graduates step right into responsible, high-paying positions. NOW you can take the same course taught in our resident schools by CORRESPONDENCE in your spare time. Training made sure and easy through our famous Cope System. If you can finish high school, you can master this profession! Prepare for a career in an $8000-$15000 yearly salary bracket—write today to ACME SCHOOL OF DIE DESIGN, Correspondence Div. X, 8 N. Jefferson St., Dayton 2, Ohio. *Approved under PL550 for Korean Veterans training.*

LAW. . .

STUDY AT HOME Legally trained men win higher positions and bigger success in business and public life. Greater opportunities now than ever before.

More Ability: More Prestige: More Money We guide you step by step. You can train at home during spare time. Degree of LL.B. We furnish all text material, including 14-volume Law Library. Low cost, easy terms. Get our valuable "Law Training for Leadership" and "Evidence" books FREE. Send NOW.

LASALLE EXTENSION UNIVERSITY, 417 South Dearborn Street
A Correspondence Institution Dept. 6493L. Chicago 5, Ill.

AIR CONDITIONING—

is the booming new trade for smart men who want more money, more security, higher type jobs.

START LEARNING AT HOME IN SPARE TIME

Never before in our 28 years of teaching REFRIGERATION, HEATING, AND AIR CONDITIONING has the business been greater, or the future brighter for ambitious, mechanically-minded men. In a boom of pent-up demand, exciting new equipment for homes, stores and factories is making the public buy to the tune of over $100,000,000.00 a year—with no end in sight. Result? A critical shortage of men (age 18-55) who know the technical principles of correctly installing this new equipment and servicing the old.

FREE BOOK!!!

Employers are having a hard time finding the men they want. Now our spare time home-study method gives you the principles and shortens your shop training. For facts, send today for our FREE BOOK.

UTILITIES ENGINEERING INSTITUTE
2525 Sheffield Ave., Dept. J-44, Chicago 14, Ill.

MI CLASSIFIED ADVERTISEMENTS

RULE OTHERS With Thoughts. Incredible power. (Details—10c.) Delmar Wisdom, 846 Sunnyside, Chicago 40.

MARRIAGE OR divorce requirements. Complete local information. Map. Questions answered. $2.00. Vegas Information Center, 1109 Silver Lake Dr., Las Vegas, Nev.

BORROW BY mail from Postal Finance Co. Employed Men and Women can easily obtain $50 to $600 Fast, Entirely By Mail. Repay in small monthly payments. Friends, relatives, employer, tradespeople will not know you are applying for loan. Advise occupation, amount wanted. Postal Finance Co., 200 Keeline Bldg., Dept. 94K, Omaha, Nebr.

"HOW CAN I Find Out?" You can! Information discreetly developed. Any matter, person, problem, anywhere. Worldwide. Officially licensed, bonded service. Established 1922. Reasonable. Confidential. William Herman, 170 Broadway, New York.

"INTERESTING MAILS"—25c keeps your mail box full three months. Bentz, Jr., Desk R/1, Chatawa, Miss.

• • • REMAIL SERVICE

MAIL RECEIVED-FORWARDED. $3 Month. Hedgpeth, Box 830, Alhambra 17, California.

LETTERS REMAILED from Hawaii, 25¢. Box 5056, Pawaa Station, Honolulu 14, Hawaii.

• • • JEWELRY

COSTUME JEWELRY Supplies. Catalog and samples. 35c. Largest line in America. Milady-Fair Co., G. P. O. Box 1328, N. Y. C.

RHINESTONES, JEWELRY settings, copper enameling, hobby kits. Illustrated catalog 10¢. J & M Novelties, Dept. CG-5, Griffith, Ind.

USED AND new watches $2 up. Free list. Southern Watches, Gray, Ga.

• • • MINERALS, PRECIOUS STONES

CUT GEMS, make jewelry. Learn easily for profit or fun. Beautiful 100 page magazine tells how; where to get supplies, fascinating! Sample 25¢ or request Free literature. Lapidary Journal, Del Mar 6, Calif.

• • • MISCELLANEOUS

WHOLESALE CATALOG! 30-80% Discounts! Appliances, musical instruments, typewriters, phonographs, watches, jewelry, recorders, housewares, etc. Consolidated Distributors, 21-46 Lafayette, Paterson 15, N. J.

GERMAN LISTS! Anything Manufactured —100 addresses—25¢. Burke Associates, Manchester 4, Mass.

$5,199.90 WAS PAID to John Betts in few weeks. Grow Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. Free Book. Mushrooms, Dept. 186, 2954 Admiral Way, Seattle, Wash.

BIG MAILS, 25¢. Listing with us will fill your mailbox with mail. C. M., Box 1211-O, Chattanooga, Tenn.

BUY WHOLESALE thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-DE, N. Y.

FREE GOLD panning lesson, catalog listing, mining books, supplies, maps—"Where To Go"—Old Prospector, Box 729D3, Lodi, Calif.

THREE TEXAS Papers $1.00. Mail forwarded $3.00 a month. 709 Cypress, Pecos, Texas.

• • • OLD GOLD WANTED

HIGHEST CASH For Old Gold, Broken Jewelry, Gold Teeth, Watches, Diamonds, Silverware, Spectacles, Platinum, Mercury. Free information. Rose Refiners, Heyworth Bldg., Chicago 2.

• • • WATCHES, WATCHMAKING

WATCH AND clock repairing books. Free information. North American. Dept. 36F, 2320 N. Milwaukee, Chicago 47, Ill.

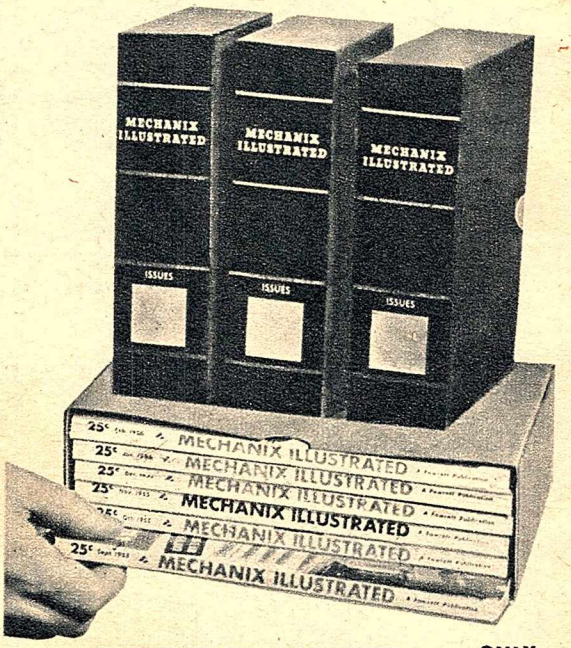
WATCHMAKERS'-JEWELERS' SUPPLIES, Instructions. Catalog 20c. Bengall Company, Culver City, Calif.

HELBROS WATCHES: Jewelry 70% discount. Wholesale catalog 25¢. Dorinda, Box 77, Huntington Station 8, N. Y.

USED AND new watches $2 up. Free list. Southern Watches, Gray, Ga.

New, Handy
MI FILE CASES

Now you can keep those treasured back issues of MECHANIX ILLUSTRATED in your library in neat, attractive cases, ready for instant reference! Our inexpensive MI File Cases are of heavy cardboard, scored and ready to glue together in a few seconds. Each holds six issues—a $1 set of four takes care of two whole years of MI! Each case handsomely printed in silver (see picture) and has a large square on which to write the dates of issues. Your choice of three rich, deep colors—red, blue or green. Set of 4 only $1 postpaid. Mail coupon TODAY!



MECHANIX ILLUSTRATED
DEPT. BC
FAWCETT BUILDING
GREENWICH, CONN.

I WANT:
_____sets in RED
_____sets in BLUE
_____sets in GREEN

Please send me _____ sets of MI File Cases as indicated above. I enclose $1 for each set.

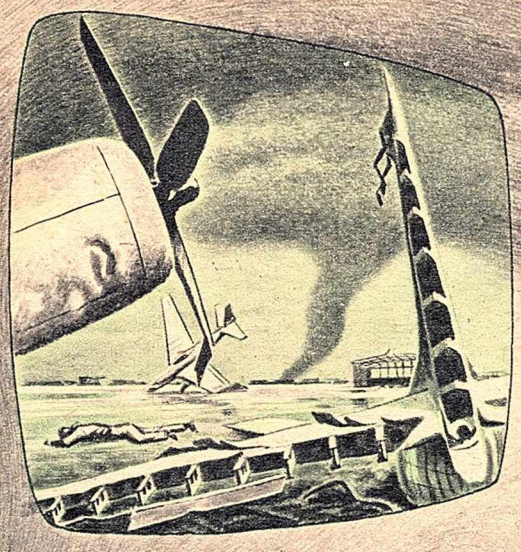
PRINT NAME.....

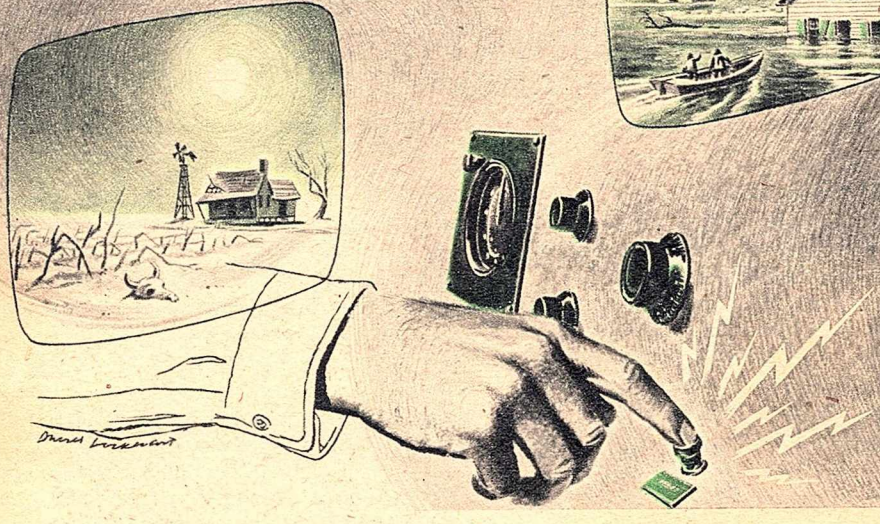
ADDRESS.....

CITY.....STATE.....

SET OF FOUR
Holds Two Full Years of MI!

ONLY **$1** POSTPAID





Control the Weather and Control the World

Will we win the crucial race to gain mastery over this most devastating of all weapons?

By Dick Halvorsen

WORLD WAR III, if it comes, may be won or lost, within 48 hours—and without a single A-bomb dropped or a single shot fired. We could win the next Big One by harnessing the mightiest physical force in the world: the

One of 37 planes wrecked by '49 hurricane atop wreckage of hangar at West Palm Beach.

hitherto uncontrollable weather.

Fanciful nonsense? Crazy day-dreaming? Science-fiction? Not a bit of it. Consider these startling facts:

A hurricane expends more energy in one minute than all the electrical power produced in the United States in the past 50 years. . .

Hurricane Edna, which ravaged the east coast of the U. S. in 1955, had more raw power packed in its 100-mph gales than all the A-bombs dropped since Hiroshima. . .

Off Luzon in the Philippines in 1944 a tropical typhoon swept down on three destroyers of the U. S. fleet. Each of the tin cans boasted 60,000-hp engines—but their strength was as nothing against the fierce winds and all three warships turned turtle and sank with all hands. . .

The crushing Pacific typhoon of October 1945 sent seven warships to the bottom, drove more than 200 aground, wiped out army installations, roads, bridges and cities on Okinawa and killed hundreds of men with its 180-knot winds and 50-foot waves. . .

Tornadoes of 1952 destroyed a good percentage of the fighting strength of the Strategic Air Command, smashing expensive fighters and giant bombers into worthless wreckage. . .

Hurricane gusts bend steel plate like tin foil, crumble concrete wharves, rip up forests, crush bridges. A tornado can drive iron rods through telegraph poles. Floods and winds have caused more devastating than all the puny weapons of man since time began.

How could weather be used as the most powerful weapon the world has ever known? History books of the future may well contain the following chapter:

"The attack against the United States was launched early on the morning of September 26, 1960. The enemy struck at half a dozen points, using submarine fleets to surprise and capture U. S. installations at Iceland, the Azores, Hawaii, Bermuda and Spitsbergen. Following the troop-laden subs came vast air armadas and then three great invasion fleets, two in the Atlantic, one in the Pacific.

"America met the attack, not with A- and H-bombers of the Strategic Air Command, but with the squadrons of the

Air Weather Service and the Navy's Weather Group. Their primary target was the enemy fleet coming up fast in the South Atlantic.

"Behind this fleet a late-season hurricane, nicknamed Jezebel, was brewing and weather planes moved to Brazilian bases to direct it. Their weapon was a super-thermite bomb which generated intense heat and produced vast low-pressure areas. As the hurricane began its normal northwesterly course, bombardiers dropped the heat bombs north and east of the swirling winds. Jezebel, seeking the line of least resistance, spun into the low-pressure area and followed the course laid down by the bombs—a course that led directly to the enemy fleet.

"The massed ships were hit with 150-knot gales and waves towering up to 100 feet. Cruisers capsized, their rudders torn loose. Overladen troop ships, unable to navigate, collided and sank. Destroyers and corvettes were driven far off their attack course. The enemy fleet scattered.

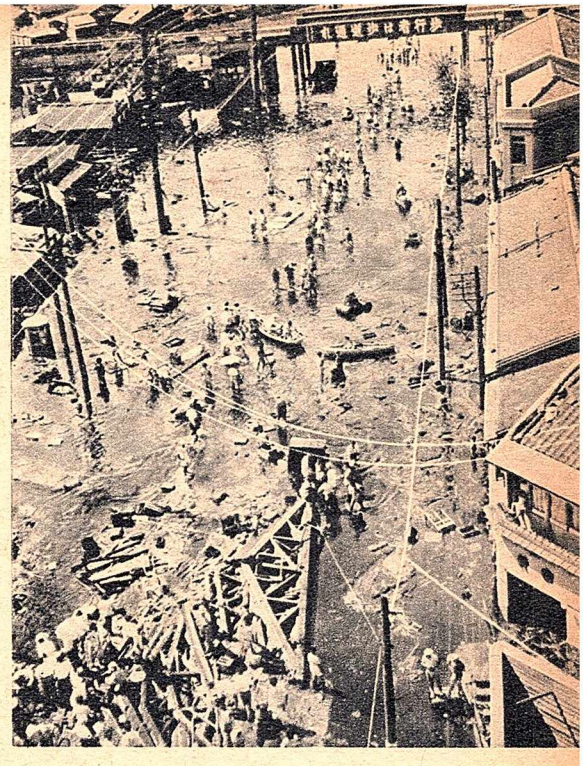
"But hurricanes were only one weapon in the arsenal of our weather service. Planes loaded with dry ice struck at the airfields captured by the enemy in our overseas bases. Heavy seeding of cloud formations over the fields produced torrents of rain that turned landing strips into quagmires and kept enemy air fleets grounded.

"Along America's east coast, at Miami, Norfolk, New York and Boston, the weather service's huge, mobile wave-making machines went into action, backed up by wind tunnels generating 2,000-mph gales. The ships of the enemy's northern invasion fleet reached the coast to find themselves faced by raging seas and winds that made water-borne or air-borne landings impossible.

"While these defensive weather measures were being taken, German- and English-based weather planes raced aloft to utilize weather as a weapon of attack. Balloons carrying packets of silver iodide crystals were released into the everflowing jet stream which pours eastward across Europe at more than 100 mph, eight miles up.

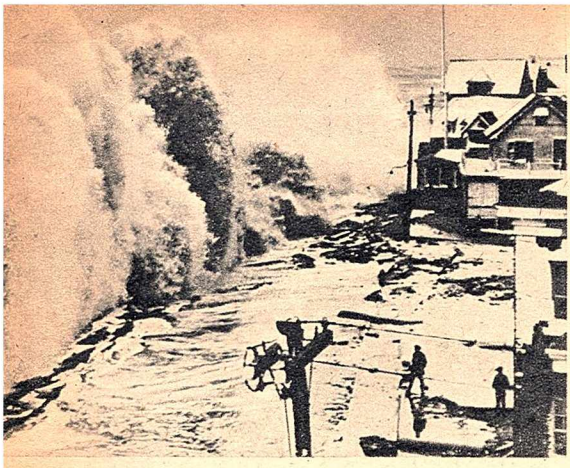
"As the packets dissolved at varying distances, the crystals spilled out and enough of them seeded rain-swollen clouds to dump torrential downpours on the enemy's industrial centers. The seeding was further aided by ground generators that pumped crystal-laden fog and smoke into winds prevailing toward the enemy's homeland.

"There was no let-up in this war-by-weather. The enemy's farm areas were saturated with thermite bombs, prolonging the seasonal drought, causing low-



Citizens of typhoon-struck Osaka hunt for belongings in the wreckage of their homes.

Wind and water moved this motorship to its roadside perch outside Kingston, Jamaica.



Homes in a Massachusetts town stand helplessly before the mounting fury of the sea.

pressure areas which brought hot winds fanning up from the southern deserts. Drought parched the enemy's crops; floods swept away his railroads; rains swamped his airfields and factories; mud bogged his roads and highways; hurricanes crushed his fleets; typhoons ravaged his coast; tornadoes crisscrossed his farmlands.

"Unable to withstand this terrible destruction that seemed more the work of a vengeful Deity than a weapon in the hands of man, the enemy sued for peace and World War III came to a quick end."

However fantastic this war report may sound, it contains nothing that is not already "in the works!" Man has always tried to control the weather, from primitive drum-beaters to jet-borne cloud-seeders. Today, cloud-seeding with dry ice and silver iodide crystals are the approved rain-making techniques, although there have been rumors of successful electronic methods. In Project Cirrus, a joint Army-Navy test of rain-making techniques, generators burning coke impregnated with silver iodide shot smoke into the air which seeded thousands of miles of cloud in a few hours, with startling, rain-producing results.

According to Ferguson Hall, leading rain-making authority of the U. S. Weather Bureau, it would take a score of planes carrying 500,000 pounds of dry ice to seed a 100-square-mile area. With such an amount, he says, "We might even break up a lightning storm or kill a tornado or hurricane."

According to Robert H. Simpson, director of the Bureau's "Project Whirlwind," data gathered in the past few hurricane seasons has produced evidence that hurricanes have an Achilles' Heel where the application of force might affect its formation and path. But finding that vulnerable spot will require a systematic search.

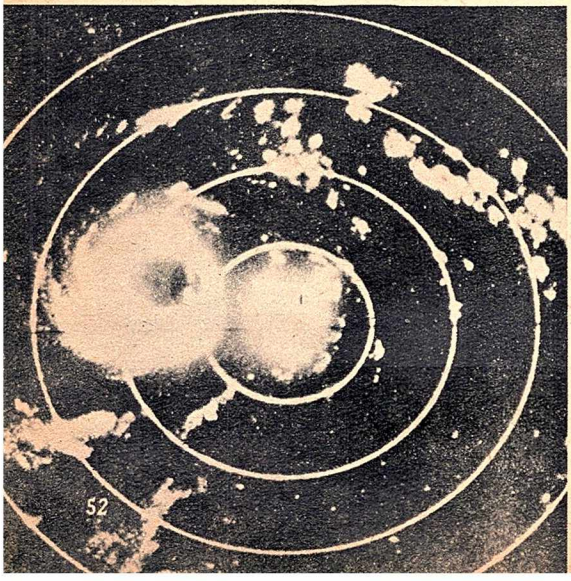
There is much we have to learn about hurricanes. We do not yet know for sure the source of the storm's energy, nor how it grows. We don't know why a hurricane causes a "storm surge"—a general rise in water level inundating coastal regions. Hurricane waves more than 100 feet high have been reported, but do they occur singly or in series?

Weather cannot be duplicated in the laboratory to study cause and effect. Even on a clear, calm day the forces involved vary from minute to minute. The enormous number of unknowns makes accurate prediction a difficult job even for an electronic brain.

But in spite of the difficulties involved, the attack against the problems of weather prediction and control is going forward rapidly on many fronts.

Ground fogs have been conquered by dry ice and by heat. The imagination of meteorologists has been unfettered by these early victories and recently we have had such eye-opening suggestions

How a hurricane appears on airborne radar scope. Photo by Navy reconnaissance pilot.



as building huge ocean barriers to deflect warm currents to melt the arctic ice and make Greenland habitable. Another novel suggestion has been to drop soot on glacial areas to absorb the heat of the sun and melt the deep-frozen snow.

So great have been the strides of meteorology in recent years that Dr. Edward Teller, famed as father of the H-bomb, has predicted that weather control will be possible within ten years.

But will weather control be used for the good of mankind? Each victory against the forces of nature puts another deadly weapon in man's arsenal. And here we are dealing with a force that makes man-made weapons seem like slingshots and beanshooters.

You can be sure that the military leaders of all nations are pushing research on weather control with all possible speed. Mathematician John von Neumann predicts that by 1980 a Weather Commission will be able to flick a switch and thaw the polar regions, or flick another switch and inflict a new Ice Age on the enemy's terrain.

Scientist Vincent Schaefer has stated that it is *already* possible to limit the formation of super-cooled clouds in the atmosphere throughout the world. "In other words," comments T. Morris Longstreth in his book Understanding The Weather, "an industrious enemy in time of war could overseed a nation's clouds and sow drought at growing seasons."

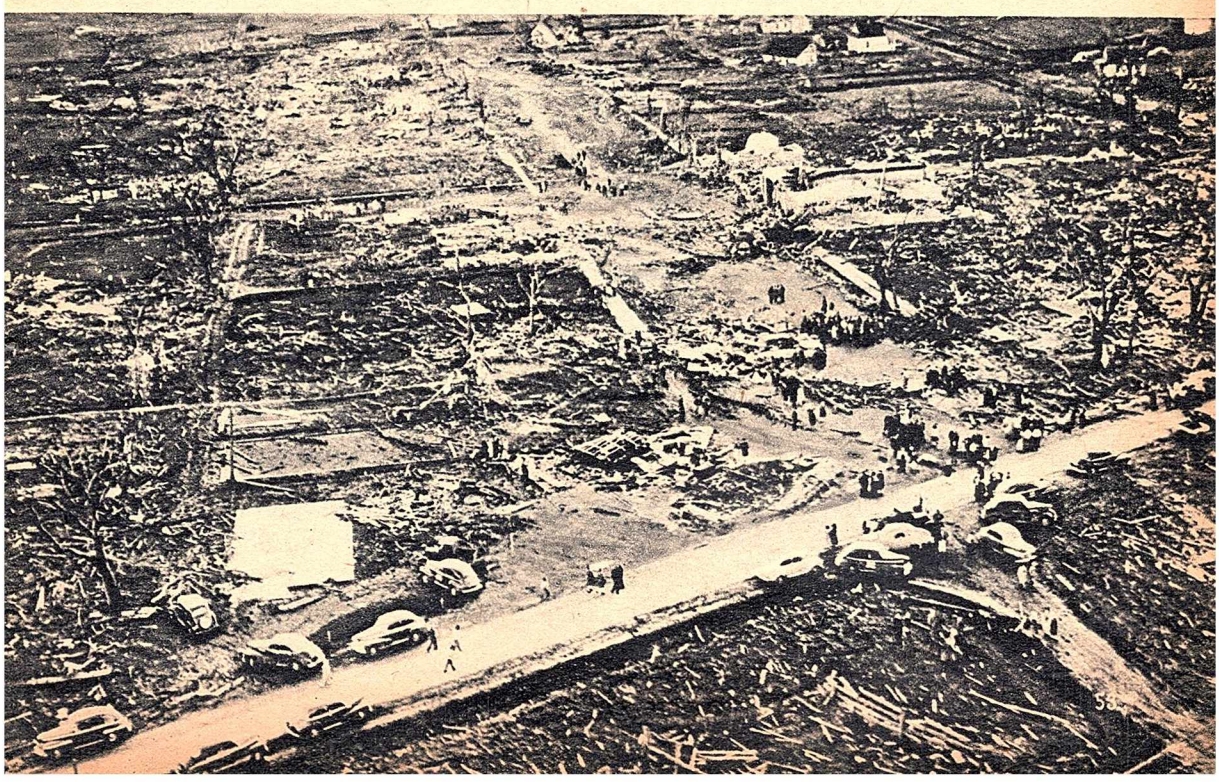
Military men know that such predictions are not beyond the realm of possibility. The race to control the weather is on—*now!* The loser will reap flood and drought, whirlwind and sandstorm, hurricane and typhoon—all the ruin and devastation the mighty forces of nature can wreak. This will be a defeat the brilliance of generals and the gallantry of a people cannot mitigate. There will be no second chance for the defeated.

So much for the loser in this dramatic race to control the weather.

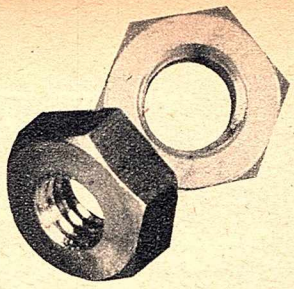
The winner will control the world! •

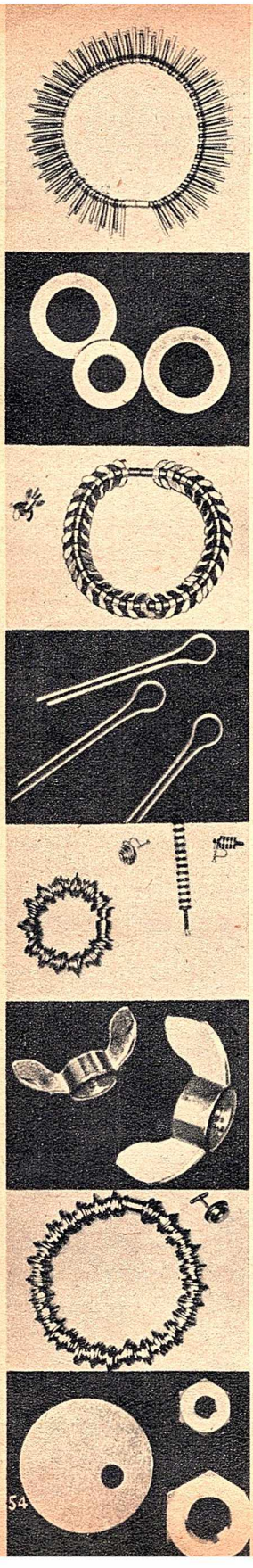
YOU CAN FORECAST THE WEATHER
See Page 66

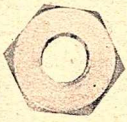
Here stood the village of Worth, Mo. A 1947 tornado wrecked it in a matter of minutes.



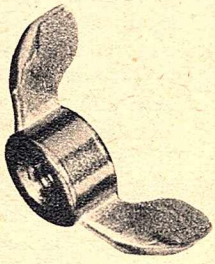
Fashion Goes Nuts





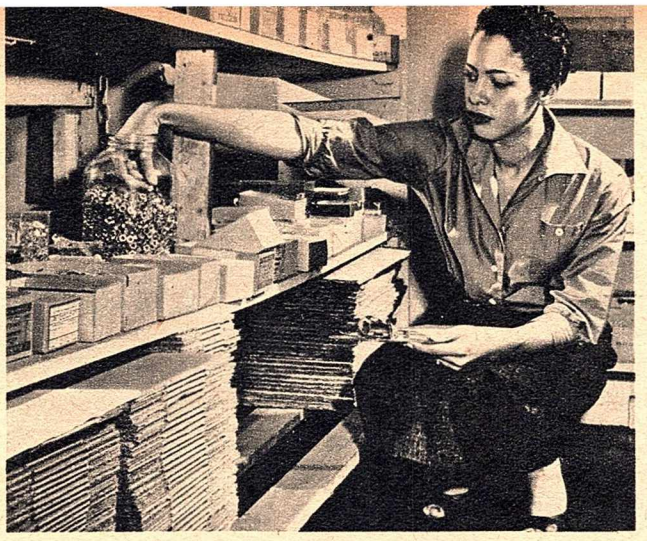


If your girl friend develops a few new rattles this may be the reason.



COUPLE of smart girls were looking through a parts catalogue for some reason or other and *arf!* the idea of making costume jewelry out of standard hardware items jumped right out and bit them. That was the beginning of Geomet, a successful two-year-old business headed by Patricia Smith, an industrial designer, and Willa Percival, a photographer. Geomet jewelry is made of nuts, washers, cotter pins and simple leather thongs. For contrast some of the odds and ends are anodized to give them color. Geomet jewelry sells in specialty shops and department stores. •

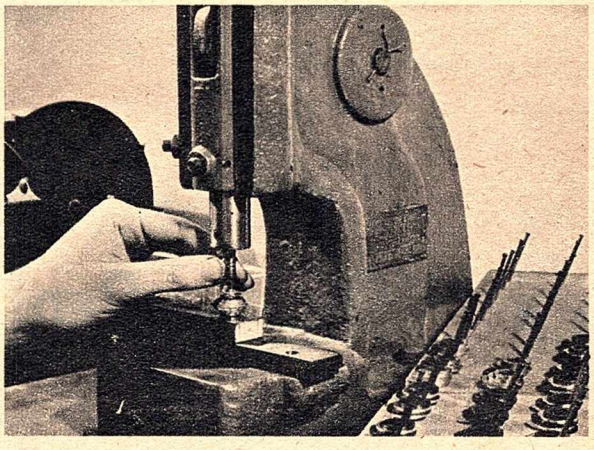
Left and below: washers, nuts, wing nuts and cotter pins make costume jewelry that's attractive in its own right.



Theresa Rosado, Geomet's assembly line, selects bright-hued hardware in the stockroom.

Nothing could be easier than assembling hex-nut earrings by inserting a cotter pin.

Punch press is used in putting together earrings, cufflinks. At right are cufflink materials assembled for the press.



Geomet's necklaces are made of hardware of contrasting hues strung on leather thongs.

Willa Percival (left) and Patricia Smith, Geomet heads, try out some new combinations.

Howard Gates, "King of the Cactus Growers," passes Creeping Devil plant on his farm.

money making IDEA

He Solved a Thorny Problem

Ever get stuck on a cactus? Howard Gates is stuck on them and sells millions of the prickly plants.

By Jack B. Kemmerer

HOWARD GATES is known as the "King of the Cactus Growers" to the people of Corona, Calif., and his annual sales of this native American plant number in the millions.

Gates' now famous Cactus Gardens was first opened in 1930 and was inspired by a cactus show he had seen in Pasadena the year before. Already well-versed in the plant field, Gates fell prey to the disease known as Cactusitis—which transforms one into a cactomaniac—or more simply, a cactus collector. Gates has never recovered.

In a constant search for new varieties, Gates' main field of exploration is Mexico and Lower California. On three extended trips to Mexico, he has traveled as far south as the Guatemalan border in search of elusive varieties. Discoverer of more than 20 different kinds, Gates has had several plants named after him.

Cactus growing is a fabulous business; you can get rich overnight, or lose your shirt. Neither seed-grown plants nor cuttings require much room, nor a long period of time to reach market size. They are grown in flats, usually 18 inches

Rooted cuttings are usually transplanted three times before reaching market size.

square, holding up to 400 plants. A flat may bring $10, wholesale. An acre holds from 10,000 to 20,000 flats at a time. At $10 a flat, the income from an acre can amount to $200,000!

Show these figures to Gates and he begins to tear his hair. He tells you the headaches of cactus farming; damping-off, failure to germinate, and the seed—don't forget the seed.

Cactus growers don't have a regular and dependable scource from which to buy seed. Gates gets most of his seed by collecting them as they mature on his own plants, a few at a time. This is a time-consuming process and the cacti fruit—containing the seed—explodes when ripe, throwing the seed in all directions. To overcome the scattering of precious seeds, Gates developed a double cone of plastic which he places over the ripening fruit. When the fruit explodes, the cone catches each seed which is then collected.

Gates also receives an occasional shipment of seeds from Mexicans who happen to know their cacti. Just anyone can't collect seeds. It is extremely important that the collector be an expert in cacti lore as he must know exactly the species he is collecting and also keep the varieties separated. If he is a cacti expert, however, it can be worth while, as cacti seeds are literally worth their weight in gold. The current price of seed is in excess of $40 an ounce, which contains about 25,000 seeds depending on the variety of cactus.

"There are no particular secrets to operating a successful cacti farm," Gates says. "It's the same as any business and it has its own peculiar problems in handling."

In nature only a very small percentage of cacti seeds germinate and the cacti grower must reverse this proportion to be successful. To do this, Gates eliminates—as much as possible—various things causing germination failures.

All plants are grown in heat-treated or fumigated soil, to reduce pest, diseases and weeds. Cacti seeds are planted in seed germinating flats and kept in a glass greenhouse with a constant temperature of 70 degrees. "Curiously enough," Gates says, "Arizona, the state with the most varieties of cactus, imports more plants than it exports. The reason is simple—summers are far too hot for cacti seeds to germinate—except for a very few."

About six months after planting, seeds germinate and the flat's surface is completely covered with hundreds of tiny cactus plants. Or at least it is supposed to be covered. Now comes one of the many headaches; often only a few of the seeds germinate, sometimes the flat is only half covered, or even less. Why? Nobody knows. Every precaution is taken and still the seeds fail to grow.

At this time it is necessary to separate the diminutive cacti plants—one at a time—and replant in flats holding 400 plants. This is all hand work and as these plants continue to grow they will be transplanted to flats holding lesser numbers of cacti until by the time they reach market size they will have gone through at least three transplantings.

Gates maintains ten full-time employees to take care of the 3,000,000 cactus plants on his farm. As the cacti reach market size, some are placed in

lath-covered houses, still in flats and on concrete bars to give good drainage. Others are set out, as are cuttings, in various lath or net covered houses. As with the flats, all ground used for cacti growing is fumigated, usually with methyl bromide, to kill pests, diseases and weeds.

Contrary to most people's beliefs, cacti use a considerable amount of water—when they can get it. This is especially true during the germination and early growing stages. When the small plants begin to sprout they receive a thorough watering twice a day, and even adult plants require weekly watering. Few cacti die from overwatering. However, the danger lies in poor drainage which causes cacti roots to rot, destroying the plant.

Cactus is a very hardy plant and extremely adept at adopting itself to varied and often rugged conditions. About 150 different groups or genera, making up more than 2,000 varieties or species, are distributed throughout the American continent. The word cactus stems from the Greek word kaktos, meaning prickly plant. The plants are easily recognized by their fleshy stems and branches, foliage leaves—in most cases—being replaced by scales or sharp spines. Although cacti are succulent plants, not all succulent plants are cacti.

Gates estimates only about 75 of more than 2,000 known cactus varieties can be grown profitably in large-scale commercial production. Retail outlets are numerous. Dime and department stores sell many varieties of cactus. So do florists, novelty stores and supermarket grocery chains. A national food company has, on several occasions, offered potted plants as premiums with box tops.

"A considerable part of the business is dish garden trade," Gates says. "Probably the biggest appeal is that most kinds of cactus will do well anywhere, even in steamheated apartments with practically no care."

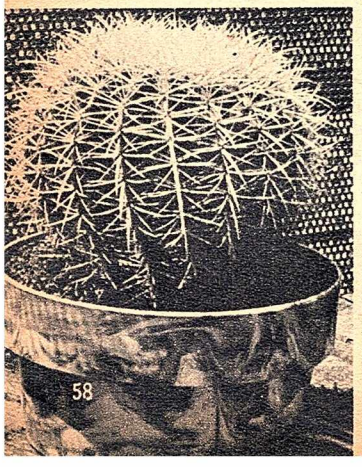
Gates' sales of plants annually exceed the 1,000,000 mark and he ships not only to most states but to many foreign countries. During the rush season the farm ships a daily average of 20,000 plants and on several occasions have shipped 35,000 in a single day. The prices range all the way from 25 cents to $25 for a single plant. The rare species Gates has in his private collection are not for sale at any price.

Packed in specially developed cartons, the multi-spined cactus plants are carefully placed in layers of shredded paper. As the plants are capable of standing long waterless periods and take almost any abuse, they can be shipped in this manner anywhere in the world and arrive in good condition.

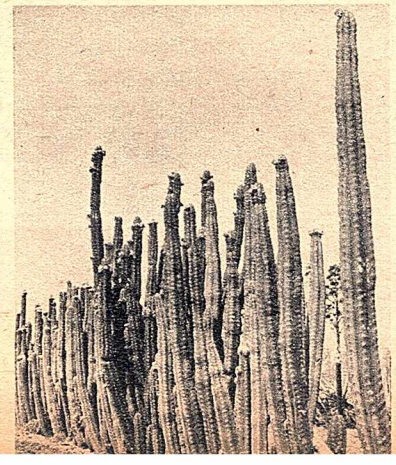
Today, Gates says his exploring days are over but he will continue to grow and sell millions of cactus plants each year as long as the demand lasts.

And as long as there are people, that well known disease, Cactusitis, will furnish customers for his and other farms. •

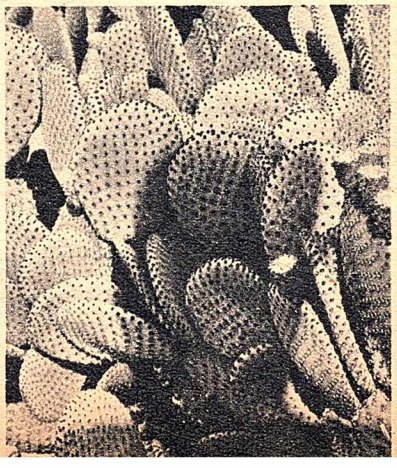
Golden Balls grown in plastic greenhouse came from seeds Gates planted 25 years ago.



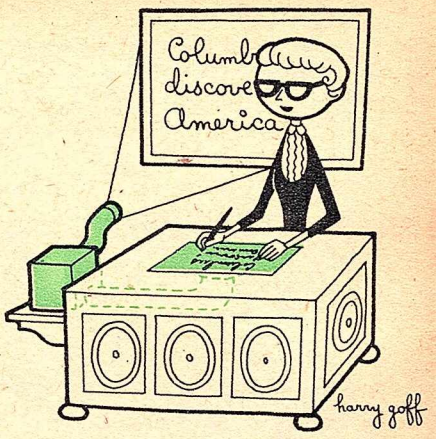
Large specimens of the hardy spiny plant are grown in the open field of 15-acre farm.



Here's a smaller species. Some adult cacti weigh ten or more tons; others are button size.



POINTED ROD in pipe on prow of boat would allow fisherman to anchor craft by stepping on rod. Shurl Churchill, Strasburg, Ohio.

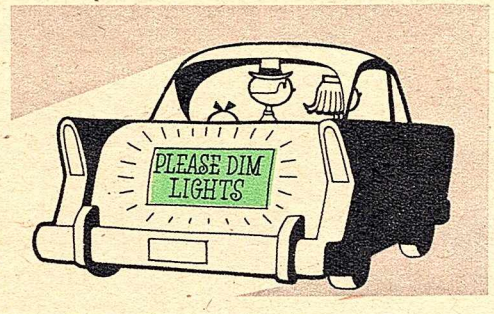


PROJECTION SYSTEM that reproduces on the blackboard notes which teacher writes at her desk. Frank Healey, Carbondale, Pa.

LUNG SAVERS of compressed air (or helium) in cans so that kiddies can easily blow up balloons. Frank Leonard, Louisville, Ky.

INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44th St., N.Y. 36, N.Y. Each one printed will be awarded $5.



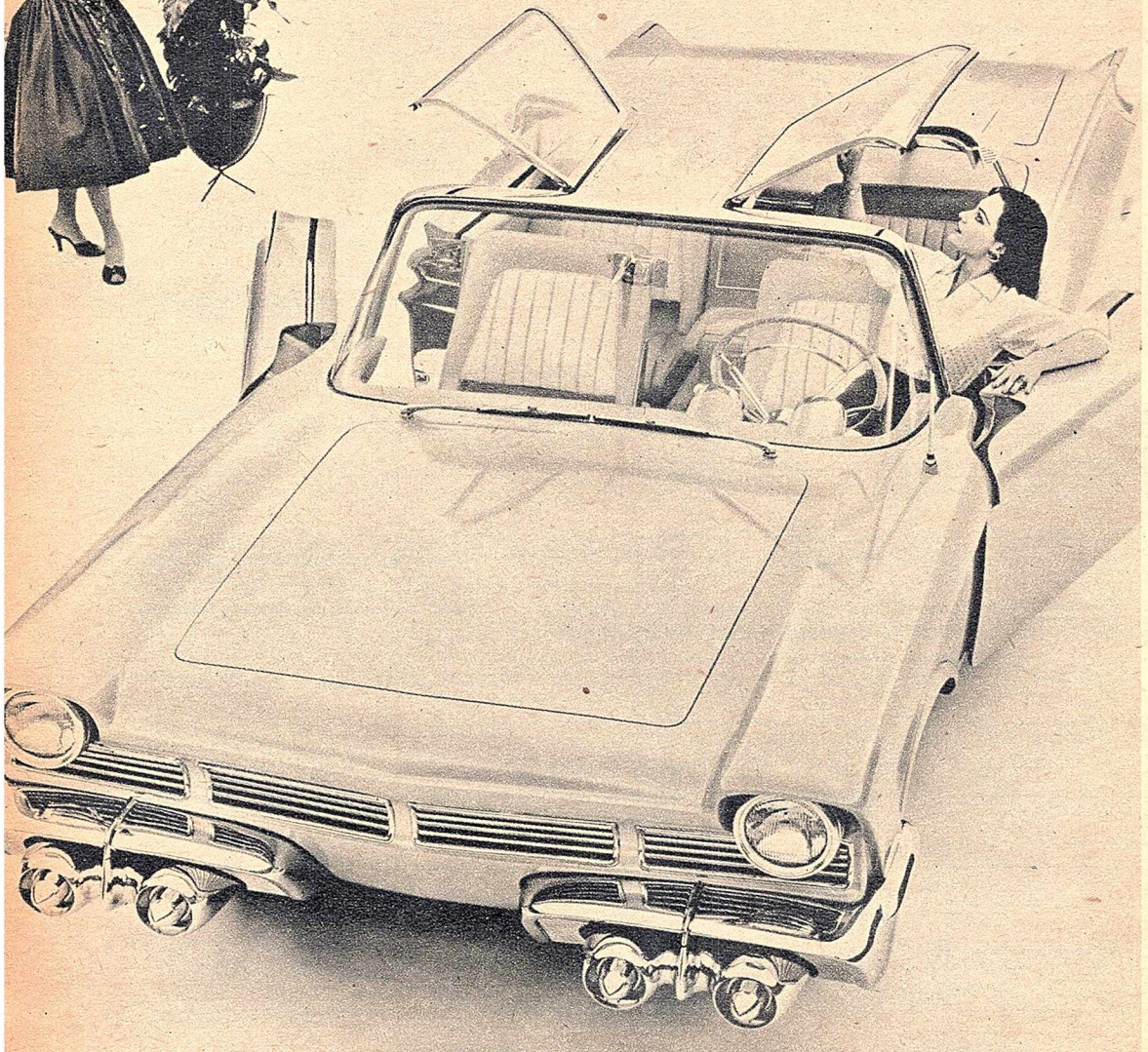
"PLEASE DIM LIGHTS" sign on rear of auto illuminated automatically from brights of the car behind. Roger Yeaton, Groton, N. Y.

EDIBLE PAPER around candy won't become gooey but hungry Junior can gobble it immediately. Hoyle Broome, Salem, N. C.

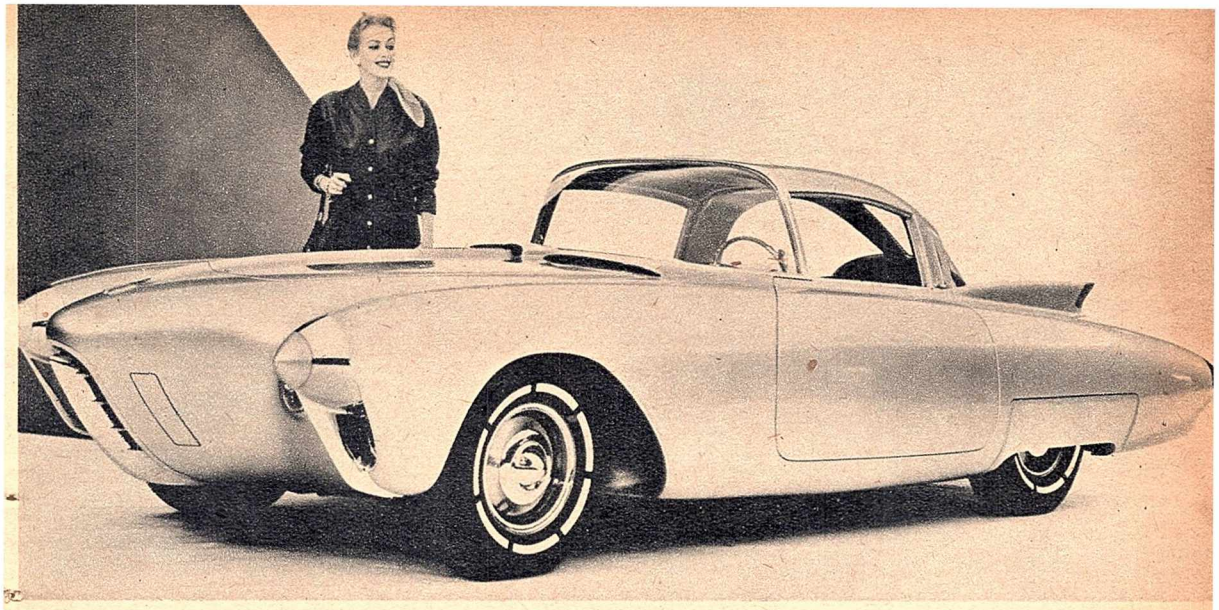
CAR OUTLOOK FOR 1957

Radar brakes, fuel injection, steel convertible tops, smaller wheels and lower silhouettes may make '57 one of the most exciting years in automotive history.

By Stanley H. Brams



Mercury's XM-Turnpike Cruiser has butterfly wing doors for easier entrance, exit. One maker may introduce them next year.



Oldsmobile Golden Rocket's 13-inch wheel diameter exemplifies trend to smaller wheels.

WHEN you slide behind the wheel of your 1957 car, the look from the driver's seat to the road (or from the road, looking at the car) will be quite different. And the way this model threads through traffic or responds on the highway will be pleasantly improved—as will the way it stops.

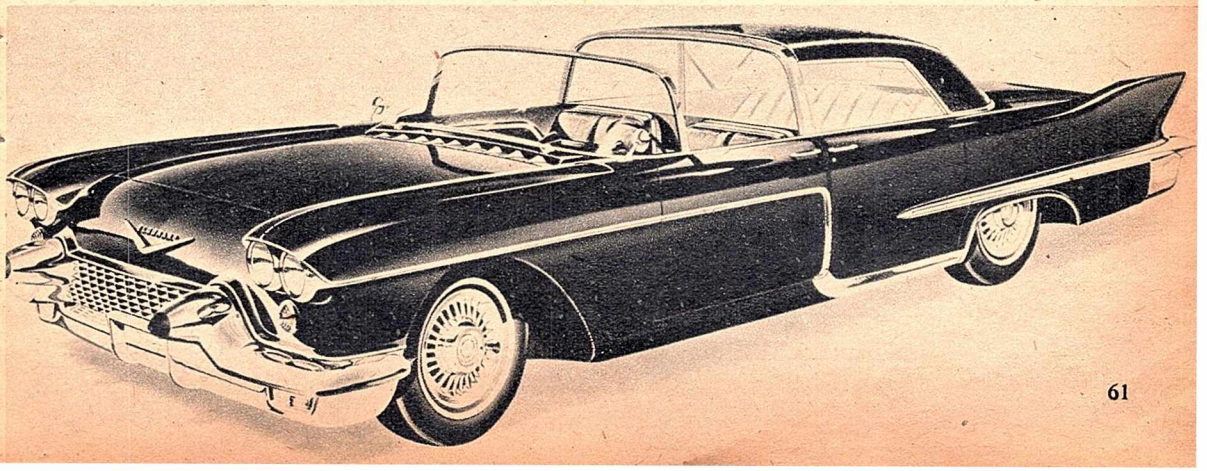
In short, 1957 cars promise advances and styling changes that haven't been possible up to now. Some of the improvements planned may not be ready but enough will come to make next year highly stimulating.

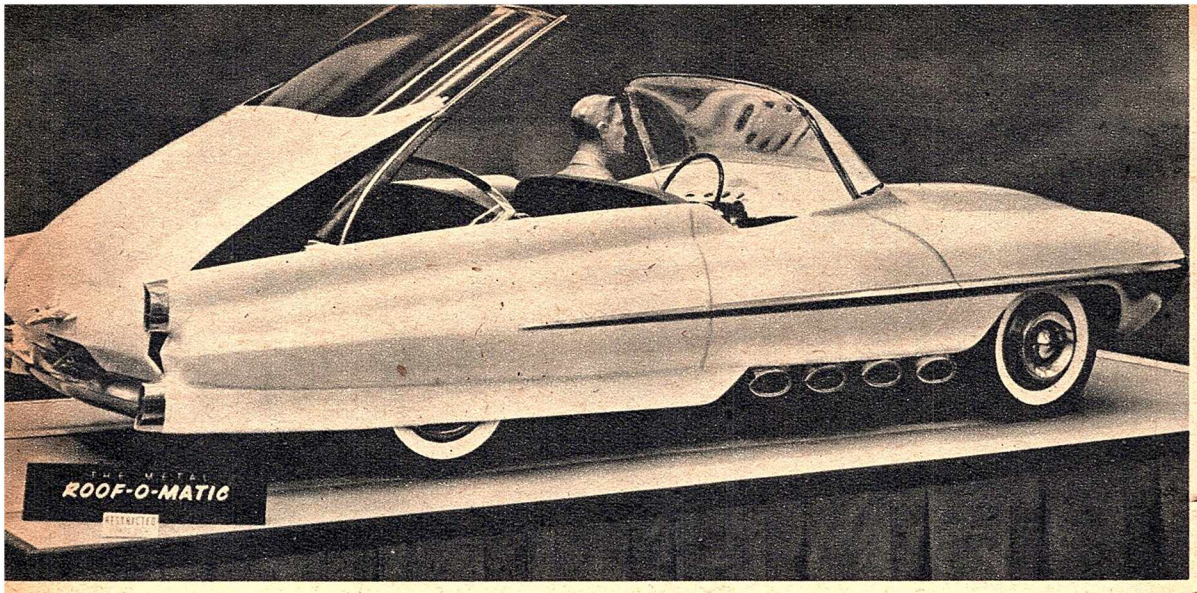
One of the most remarkable improvements in the works is the radar brake which might well be the first step toward completely automatic car operation.

The radar brake will be directed by a screen mounted in front of your grille, small enough so that it will hardly be noticeable. From the screen will be transmitted bounce-back detection beams, just like wartime radar. Whenever the beams hit an obstacle ahead they'll message back to the brake system. The brakes will automatically take hold through a system of solenoids, reducing car speed even if the driver is unaware of what's ahead.

An adjustable "bounce" is hooked up with car speed so the safety factor will be as worthwhile at top highway speed, with greater distances between cars, as

Several '57 models, including Cadillac Brougham Town car, may feature four headlamps.



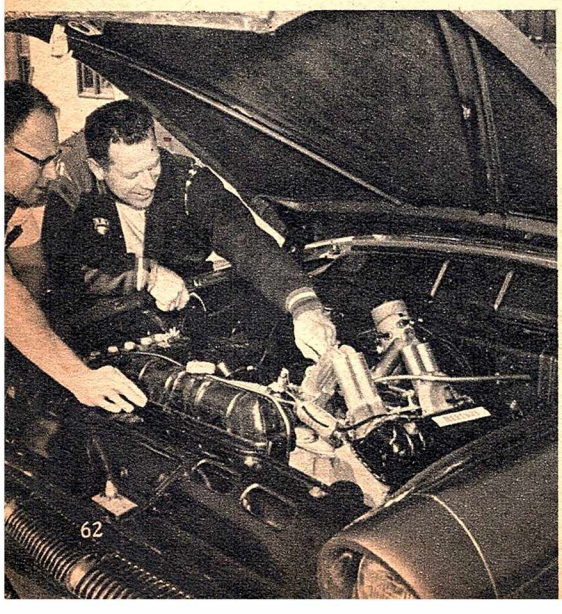


Ford Syrtis model's steel convertible top that slides into rear deck is on tap for '57.

it is at relatively modest speeds where you are apt to crowd closer to the car in front. Of course the beam can be cut off entirely for city driving so you won't be stopping and starting in continuous jerks.

Next year you will see a significant step in casing evolution. Wheels and tires will be smaller on many cars. Fourteen-inch casings will make a bow, not only a full inch narrower in diameter than the standard tires of recent years but tires that will need inflating only to about 20 lbs. or so. The result will be an easier, softer ride, lowered silhouette, modestly faster acceleration and slightly less top speed.

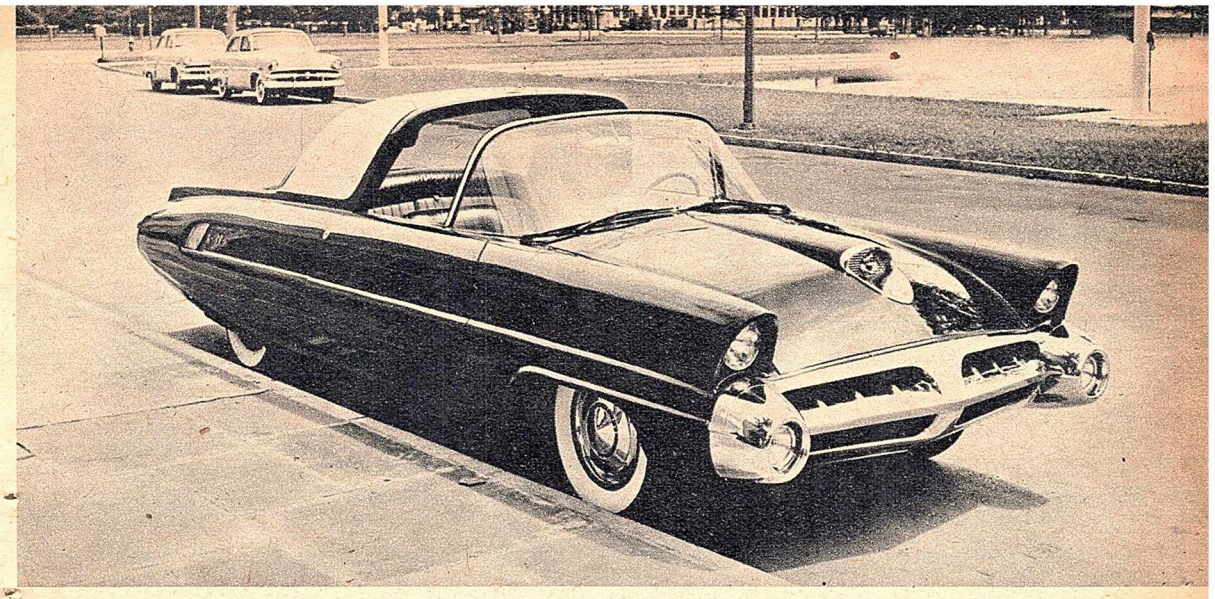
Detroit expects at least one maker to use fuel injection like this Mercury prototype.



In addition to radar brakes, there promises to be some other notable change in braking systems—a subject of concentrated study in the past decade when speeds and power have been increasing and brake development has lagged behind.

Reports are that 1957 will see disc brakes on more production cars. The virtue of these brakes is that more surface is provided than is possible with today's conventional cylindrical shoes. A circle of metal revolves with the wheel and pressure is applied against it by movable pads. Friction is spread over a larger area and cooling is somewhat improved.

Above the wheels will be new body shells that will be lower and, hence, look longer than ever before. Part of the new lowness will derive from the smaller tires and wheels; although a widened cross-section on the tires will eat up part of the one-inch savings in height that would otherwise be realized. Some more of it will come about in a natural, evolutionary sort of way with both floors and rooflines lowered so that passengers can sit closer to the ground without any sacrifice in headroom.



You'll be seeing more of the scenic slide-away plastic top, shown on this Ford X-100.

In order to maintain an unchanged amount of entrance room, and possibly to increase it, doors may reach farther upward. Some are likely to intrude a bit into the roof. One producer, at least, is thinking intently about introducing a so-called "butterfly wing" top to make entrance easier. This would follow the designing of some dream cars shown earlier this year. As the door opened a segment of the roof immediately above it would raise gently, like a wing, making it possible to move into the seat almost as you enter a convertible with the top down. Plans also call for a hardtop model whose entire roof (or most of it) will slide back into the rear deck, like an orthodox convertible.

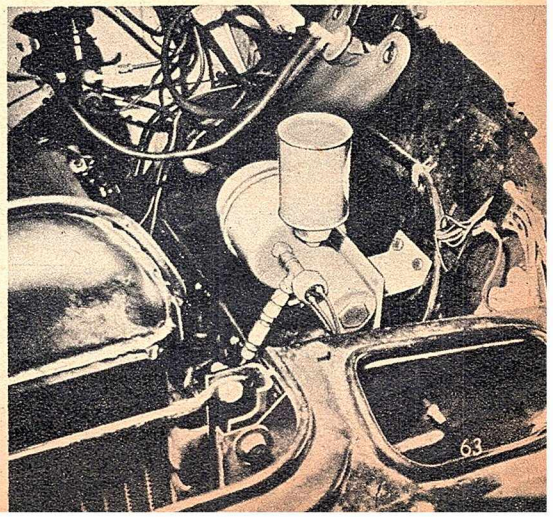
In a more general sense, next year will likely see continuation of two approaches toward design, both of them considerably refined. One might be called the General Motors school of styling, with squarish hoods and rear decks. The other has been followed by Ford and Chrysler stylists and is characterized by a line rounding downward, particularly along the hood.

Both schools of design, however, seem bidding to go curvy on the sides. There is expected to be seen a gentle arc, wheel line to roof line, resulting in more ample hip room on the seats and in the better handling that derives from a widened structure. That arc, too, will mean the introduction of subtly curved side glass.

More glass everywhere. That will be a hallmark of the 1957 models as it has been for a steady number of years. The glassmakers are hard at work providing not only larger and more intricately rounded panes but also stronger ones. Sun-filtering tinted glass will be standard on a number of makes.

The bright metal trim on your 1957 will stand up better than in past years. The reason is in the metallurgy of the material. More [*Continued on page* 171]

Centralized lubrication system developed by Stewart-Warner is slated for wider use.

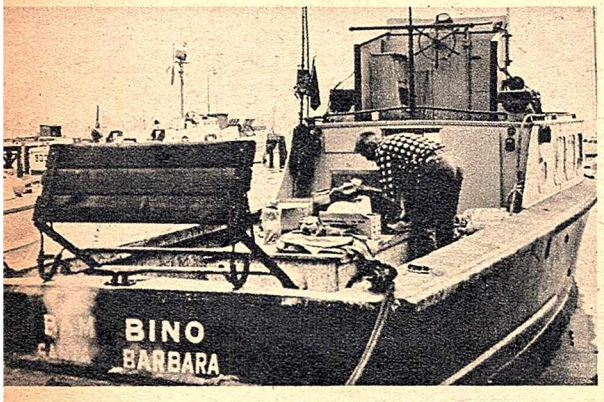


People Who Do Things

GDC diver comes to the surface after examining rock formations on the floor of ocean.

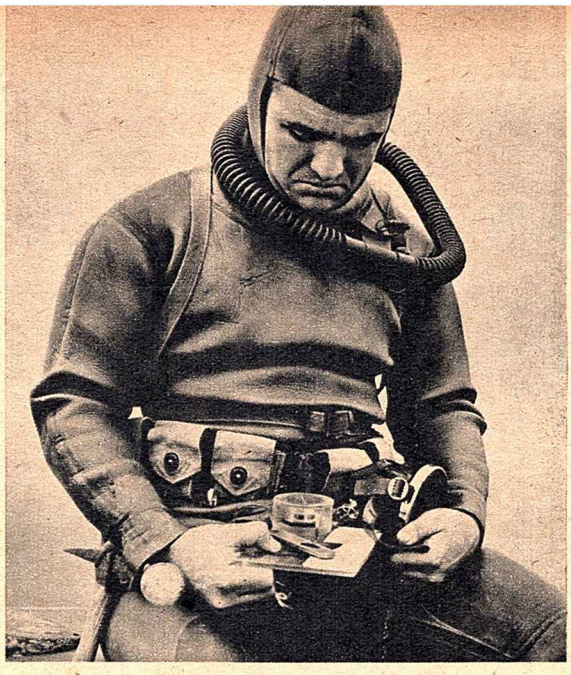
They Dive for Oil

ARMED with prospectors' pick-hammers and clad in neoprene suits, frogmen of the Geological Diving Consultants of San Diego swim along the ocean bottom off the California coast mapping sections of it foot by foot. GDC was formed two years ago when the members, all marine geologists, decided there was a need for their services. They assist oil companies in seismic explorations to locate new oil sources 150 feet below the surface of the sea. •

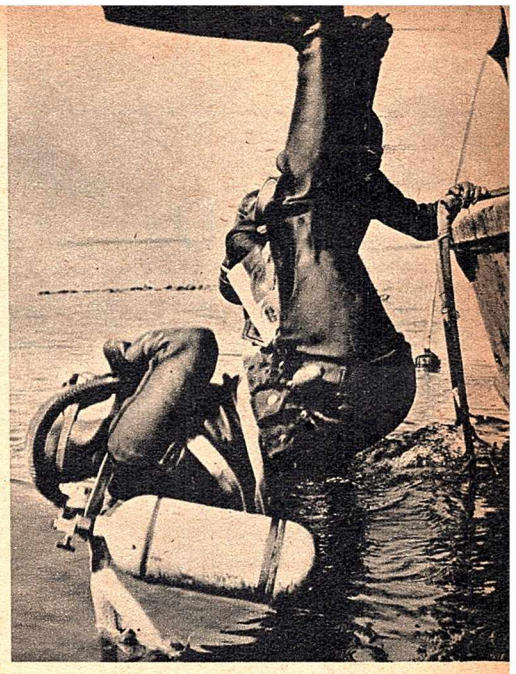


Undersea geologists ready their cruiser for trip to explore sea bottom for oil.

Readings are taken when sample is sent up to determine exact location of formations.

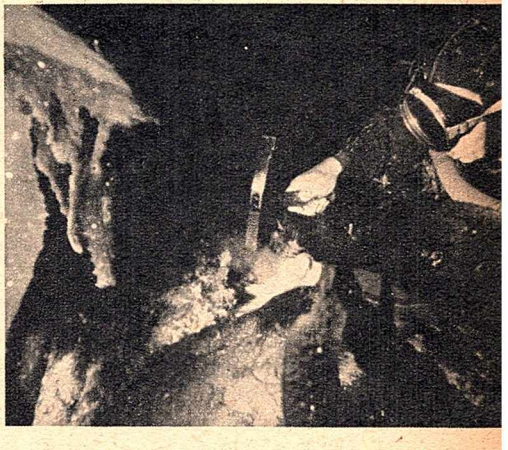


Diver wears a tough neoprene suit, totes special underwater compass, inclinometer.

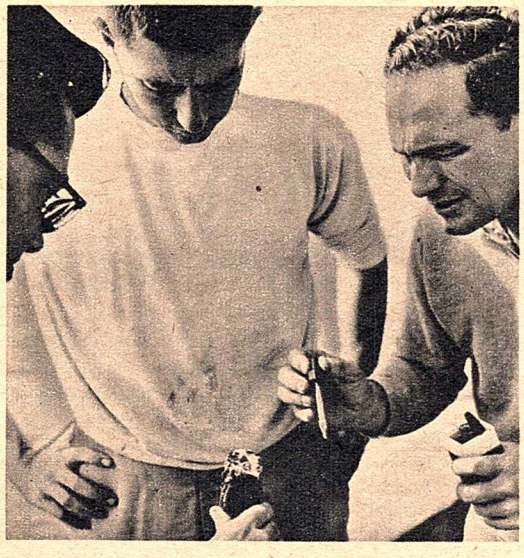


Over he goes! Back flip off boat's rail is quick way to get to the bottom of the sea.

Here diver uses his pick-hammer to take rock sample from outcrop on ocean floor.



Samples are tested with acid and are important in locating underwater oil fields.



Divers returning to surface discuss various features of the rocks they bring up.

Be Your Own Weather Forecaster

You need only a few basic pieces of equipment to start your own forecasting center at home.

By George Laycock

THE weatherman, for all his science, often finds rain falling where he said the sun would shine. The next time he spoils your plans for a family picnic or a week-end fishing trip you may want to get even with him by becoming your own weather prophet.

Making your own weather forecasts is neither difficult nor expensive. Like all weathermen, you'll be wrong part of the time. But you'll find that you can predict tomorrow's weather with considerable accuracy.

Amateur forecasters maintain private weather stations in every part of the land. They give several reasons for their homegrown weather bureaus. Temperatures may vary five degrees or more between their homes and the nearest official weather station. This knowledge is important when planning new concrete work, adding antifreeze to the car, or covering the flowers. Sportsmen and farmers can always make good use of local weather knowledge. And it can become an engrossing hobby.

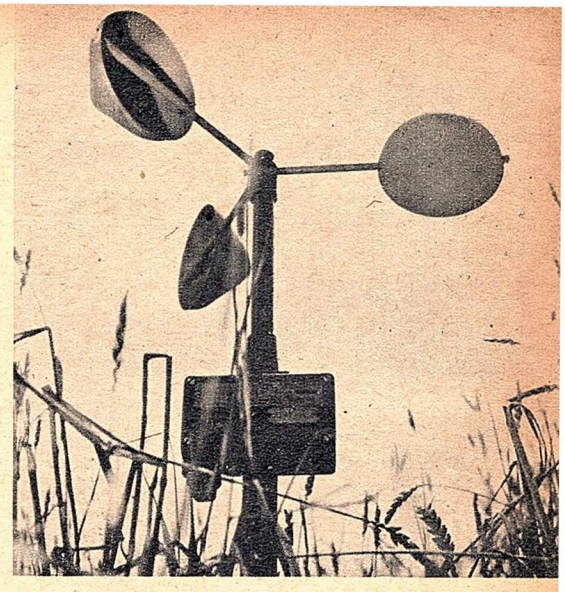
If you're in a section of the country where the U. S. Weather Bureau needs more weather observers you may join the 5,000 citizens who day in and out volunteer their time to make weather observations for the government. These volunteer weathermen make up one of the government's most unusual staff of workers. The Weather Bureau furnishes them with rain gauges, ther-

mometers and record forms needed for their work. It's little wonder that in the decades since the idea started the United States has been able to amass roomfuls of records that no one has yet had time to fully study.

If the Weather Bureau doesn't have a place in its lineup for another observer in your area, you can still be the ace weatherman in your neighborhood. In southern Ohio, corn and beef farmer Clarence Ragland has maintained his own weather station for nine years. Ragland is not a Weather Bureau volunteer because he is too close to the Cincinnati station. But he makes good use of his weather instruments to help in his farming and as a hobby. "There's a challenge in forecasting weather," says Ragland. "It changes so often that you can't be right all the time. But you can try."

The real answer is a home weather station equipped with a few pieces of basic weather study equipment. First choice is a barometer. You can purchase one for from $3 to $4 and up. No single instrument will tell you more about the coming weather. A barometer measures atmospheric pressure and reveals changes in the pressure. The first step in using a new barometer is to set it for the elevation above sea level at your weather station. Generally this is done by setting the correct elevation on the face of the barometer opposite a marking on the case. Government weather offices will set a barometer for you. Or you can get the correct elevation from your county engineer and set your instrument accordingly. Barometers should be kept indoors, never in direct sunlight or hot places.

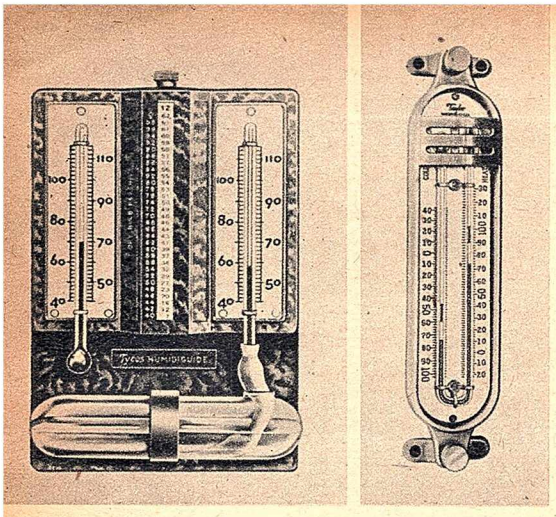
The key to approaching weather is the movement of the barometer hand that tells whether atmospheric pressure is rising or falling. A rapidly rising barometer foretells fair weather and a falling barometer indicates approaching storms. Barometers are more accurate in winter than summer because summer showers may occur without falling air pressure. Don't place too much faith in the fact that the hand on your barometer is pointing toward the words "fair" or "rain." The change in air pressure indicated by the moving hand is more revealing than the position of the hand at any given moment.



Used in agricultural research, anemometer records wind speeds at near ground level.

A rain gauge will give you an accurate record of precipitation at your weather station. The standard weather bureau type rain gauge has four parts. There is a copper can 24 inches high. Into this fits a brass measuring tube 2.53 inches in diameter and 20 inches deep. On top of

Sling hygrometer, left, is used to measure relative humidity. Rain gauge, right, collects water in funnel top and enables forecaster to tell the total precipitation.



Wet-dry bulb type hygrometer, left, gives humidity reading, sells for about $7.75. Maximum-minimum registering thermometer, right, can be had for approximately $10.

this tube is a funnel to catch rain and snow. A measuring stick completes the equipment. You can get inexpensive versions of the rain gauge for $10 or less.

You'll also need a thermometer, of course. Frequent temperature readings give clues on coming weather. A rapidly rising temperature, for instance, coupled with a falling barometer reading may reveal an approaching cold front. You may want to add maximum and minimum thermometers which reveal temperature extremes for your permament records.

Then if you want to check relative humidity you can add a hygrometer. This instrument is composed of two thermometers of the wet-dry bulb type and the difference in readings between the two is the relative humidity. This is especially important for farmers doing such jobs as drying grain with unheated forced air.

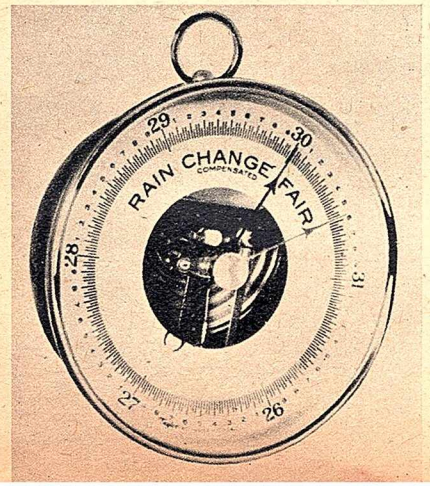
One other piece of equipment the amateur forecaster should own is a wind vane unless he wants to rely on the movement of smoke or flags or the leaves of trees. The wind speed has a tendency to rise and fall daily. It is usually lowest in the morning and highest in the afternoon. But a sudden change in wind speed aside from these daily variations often means a coming change in weather conditions. Our prevailing winds move from west to east. Winds from the south or east often bring storms with them. Fair weather generally comes from the north and west.

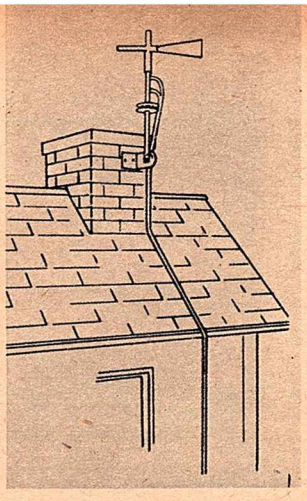
This, plus an eye on the changing cloud picture, plus your barometer readings, can usually tell you whether to take the family on that picnic or stay home.

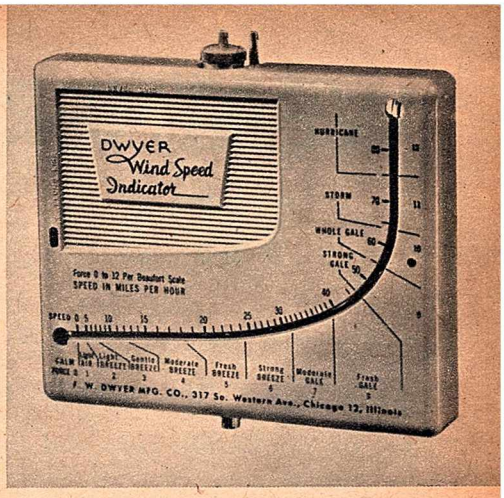
The wind vane should be erected on the roof of a building or on a high pole. The rain gauge should rest on a firm foundation in an open area. To house your thermometers and hygrometer, build a small shelter on stilts. Another valuable tool for the amateur weather forecaster, and one always handy, is the series of weather maps that run in most daily newspapers. Those maps show you the weather conditions for the whole country. By studying them you get a picture of the various air masses and the directions in which they're moving. Weather in winter travels about 25 mph and in summer about 20 mph. Thus you can predict when these masses may move into your area.

Then the approach of clouds will come as no surprise to you. And the clouds themselves can tell you much of the approaching weather. (See page 72.) For instance, as a cold front approaches it pushes ahead of it alto-cumulus or alto-stratus clouds followed by stratus or strato-cumulus and cumulo-nimbus. As the cold front passes overhead the clouds will be cumulo-nimbus and low

Brass case barometer is about $38.50. Photos courtesy Taylor Instrument Co.







Wind Speed Indicator from Abercrombie & Fitch is connected to vane on roof and gives the velocity in miles-per-hour in comfort of living room, costs about $20.

stratus. Then as the front passes on the clouds change to alto-cumulus and cumulus or strato-cumulus which ride high in the sky and thin out rapidly. Temperatures rise steadily ahead of a cold front, hold steady as the front arrives then drop rapidly with its passing.

There are a few generalities you can make about clouds. The higher they ride, the finer the weather. If they're coming in from the south they may bring rain; if from the north, clear weather should follow them. With a bit of practice in sky gazing you will soon learn to recognize clouds, tell how they change from one type to another and what the changes can bring in weather.

Probably since man first stood up on two feet nothing has so baffled him as the weather. It still baffles him. But anyone with a few pieces of equipment and a consuming interest can unravel at least some of the weather's secrets and foretell its moods in advance. •

WEATHER PROBABILITIES FOR BAROMETER READINGS

BAROMETER RISING

29.0 to 29.3 inches
Clearing, with high winds and cool wave.

29.3 to 29.6 inches
High winds with cool wave, preceded by squalls

29.6 to 29.9 inches
Fair weather, with fresh winds tonight and tomorrow

29.9 to 30.2 inches
Fair, with brisk winds, which will diminish.

30.2 to 30.5 inches
Generally fair weather, probably cool today, with variable winds

30.5 to 30.8 inches
Clear weather tonight and continued cool, with moderate winds.

30.8 to 31.00
Southeast rains with high winds.

If the barometer reading hasn't changed since the last setting, continuation of existing weather conditions may be expected.

BAROMETER FALLING

30.7 to 30.5 inches
Fair and warmer, followed by wind and rain.

30.5 to 30.2 inches
Storm brewing in the direction of the wind.

30.2 to 29.9 inches
Cloudy and warmer, followed by unsettled weather.

29.9 to 29.6 inches
Unsettled weather, increasing winds and warmer.

29.6 to 29.3 inches
Clearing, slight squalls, fair and cooler tomorrow

29.3 to 29.0 inches
Clearing weather, with high winds, accompanied by squalls and cooler.

29.0 to 28.7 inches
Stormy weather.

NOTE: The rate and intensity of a coming weather change is proportional to the rate and intensity of change in pressure.

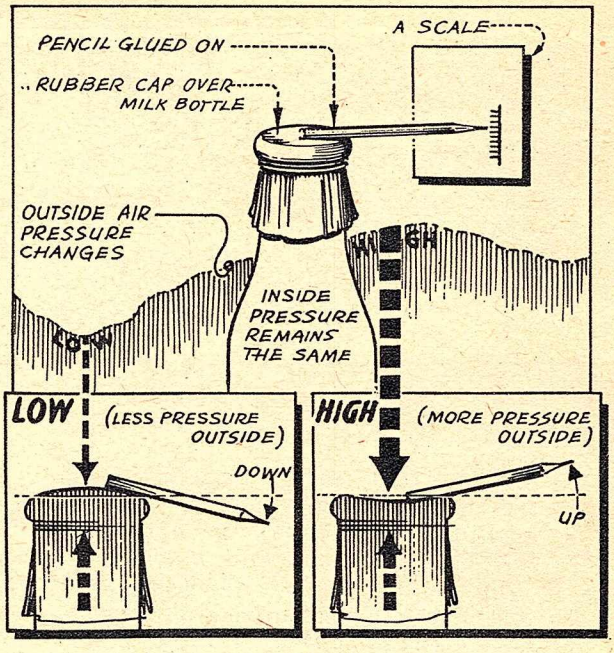
Chart courtesy Taylor Instrument Co.

WEATHER TIPS

How weather-wise are you? Here are practical tips to make the job of prediction easy and fun.

By Eric Sloane

YOU can make amazingly accurate predictions by using these handy hints from the timeless folklore of weather forecasting. They are reprinted from Eric Sloane's Weather Book, published by Duell, Sloan and Pearce. •



You can make your own aneroid barometer at home using the materials shown above.

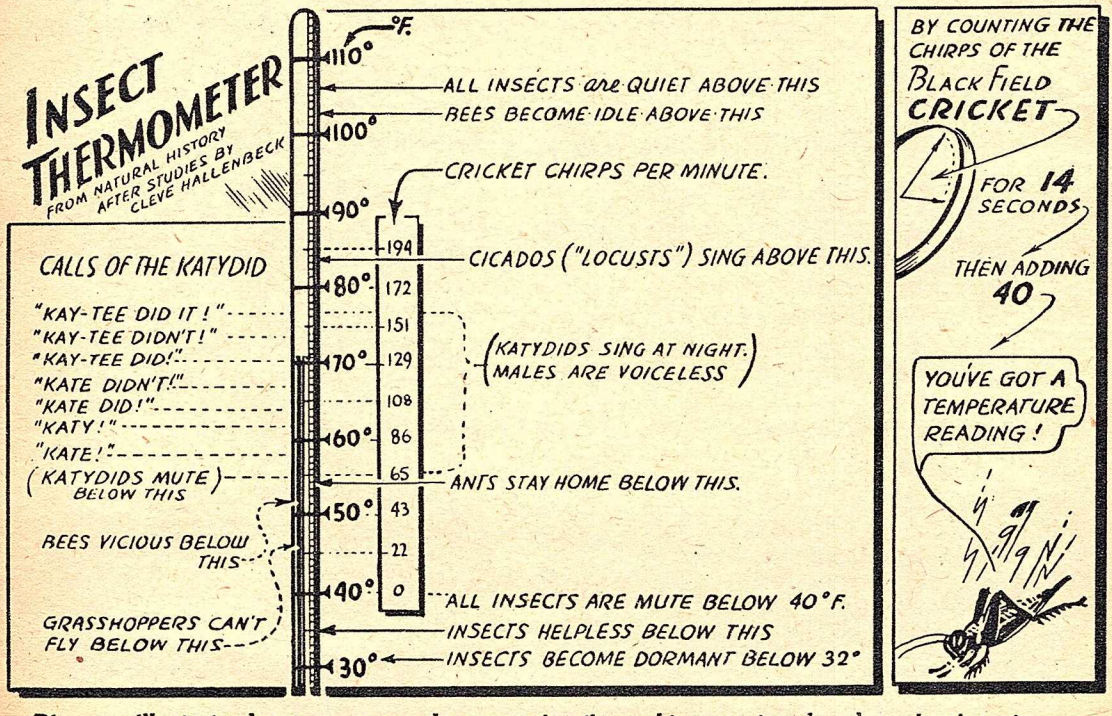
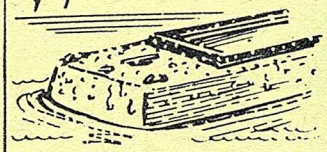


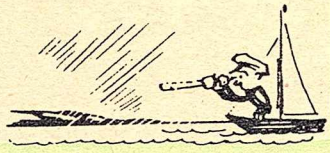
Diagram illustrates how you can make approximations of temperature by observing insects.

Sailors were looked upon as weather experts in days of old. They learned lore at sea.

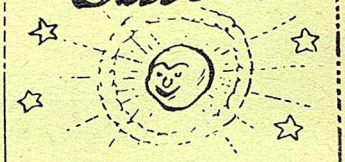
Weather Sayings of the old Sailors



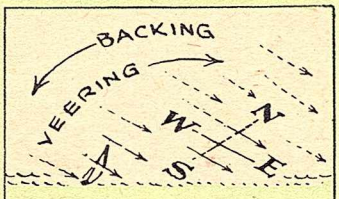
DEW INDICATES A GOOD DAY AHEAD: A DRY MORNING IS SIGN OF SHOWERS.



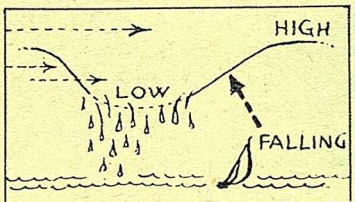
DISTANT SHORES LOOM UP "NEARER" BEFORE RAIN BECAUSE OF THINNING OF THE AIR.



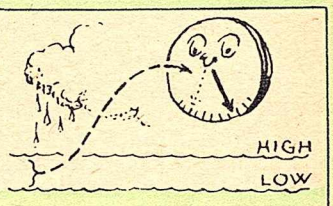
LARGE HALO AROUND THE MOON INDICATES CIRRUS CLOUDFORM & WARM FRONT RAIN.



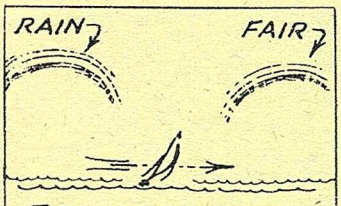
A VEERING WIND IS SIGN OF FAIR WEATHER: BACKING WIND MEANS RAIN.



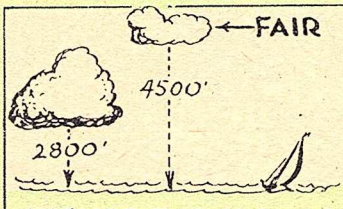
FALLING BAROMETER INDICATES NEARING "LOW" AREA, WITH WINDS AND RAIN.



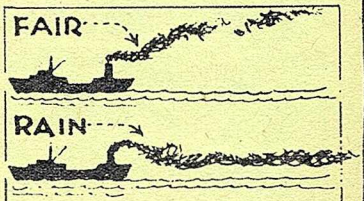
RAIN IS MOST FREQUENT AT THE TURN OF THE TIDE (IF AIR IS HUMID)



RAINBOW TO WINDWARD, RAIN AHEAD. RAINBOW TO LEEWARD, RAINS END.

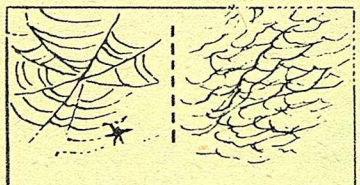


HIGHER THE CLOUDS, FINER THE WEATHER. LOWERING CEILINGS FORETELL A RAIN.

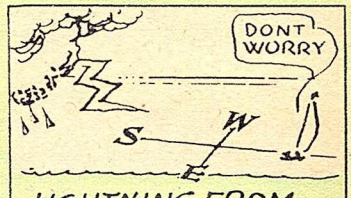


SMOKE THAT CURLS DOWNWARD AND LINGERS, MEANS A NEARING STORM.

THINNING AIR IS HARDER TO FLY IN. BIRDS "SIT IT OUT" BEFORE A STORM



SKY FULL OF WEBBY CIRRUS FORETELLS DISTURBANCE AND RAINS ON ITS WAY



LIGHTNING FROM THE W. OR N.W. WILL REACH YOU; FROM S. OR S.E WILL PASS

Eric Sloane

HOW TO READ

If you know which ones to believe, those old weather adages can make

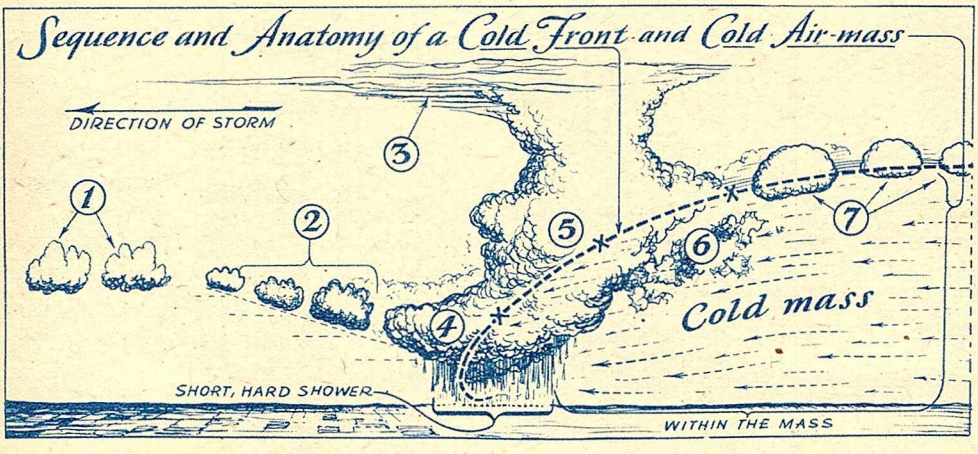
THE meteorologists say that you can't predict weather by just looking at the clouds. Yet often the sky predicts local weather better than national weather reports.

Clouds are to the atmosphere what white-caps are to the ocean; usually they tell what is already happening. But sometimes clouds can tell you what's in store just over the horizon. As you find below, a fast-moving, back-leaning storm will creep up on you faster than the slow-moving kind that flows overhead first to warn you.

Weather change is usually caused by the moving in of a new air-mass. The biggest cloud-fuss and rainfall occurs along the air-mass front, so the cloud predictions explained here are drawn along with their frontal plans.

When a cold air-mass approaches with its clouds and rain, its front (shown by X in the drawing) slants backward: the snow-plow shape will strike without any overhead warning. Only the great height of warm air thunderheads pushed into the sub-stratosphere by the cold-air "plow" gives warning. But when a warm air-mass approaches, its front (shown again by X) slants forward and flows overhead for quite a while before the rain begins.

Note that all the clouds before, at, and behind the cold front are lumpy or cumulus in type; and notice that all the clouds before, at, and behind the warm front are ceiling-like or stratus in type. As an air-mass wears itself out, its cloud forms become less typical; but generally you may look up at any time and tell



1. Any time you see anything but regular, oval cumulus clouds, you can look for a change. Chaotic, towering cumulus clouds shown here say a cold front is coming. 2. When cumulus clouds get bigger, darker and lower, a front may be just behind them. 3. Thunderhead's anvil top leans the same way the storm is traveling—weathermen call it the direction of the storm—and looks, from the ground, like a high webby ceiling. 4. The first dark cloud shelf of a thunderhead or line squall cloud is too high for rain but it will follow in a few minutes. 5. The thunderhead (cumulo-nimbus) is most common in summer. Rain and/or hail falls directly beneath. 6. Low scud (broken cloud fragments) follow the storm, herald clear air. 7. Cold air-mass cumulus; the higher, whiter, more oval and flat-bottomed, the longer the fine, dry weather.

THE CLOUDS

you a short-order local forecaster.

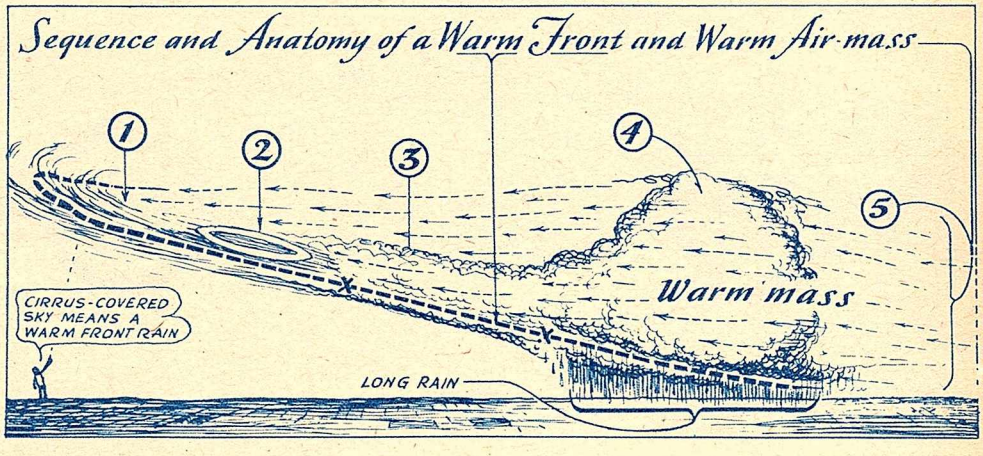
what kind of air-mass you are in or what kind of an air-mass change is approaching.

A few pointers on cloud folklore: The sailor's "mackerel sky before a storm" saying is untrue; cirrocumulus or mackerel sky, which resembles rippled sand, merely indicates a change. "Mare's tails indicate a bad storm," is also an untrue saying: only when the whole sky is shrouded with these cirrus forms is the saying true. Sun and moon halos, caused by the light shining through ice-clouds, are, on the other hand, accurate signs of warm front precipitation (rain) during the warmer months.

Wind directions may be ascertained by watching the direction of cloud movement: by then facing the wind and pointing to your right, you can locate to the nearest low pressure storm center. Because most summer storms move from the west to the east, lightning or storm clouds from the west or northwest will always reach you; from any other direction, the storm usually will pass you by. Clouds may move in different directions at different altitudes, but the higher wind direction will lower in time.

Darkness of clouds has no definite meaning, but their height is important. Low clouds can rain to the earth. High clouds, no matter how dark, should never worry you; only when their altitude begins to lessen is rain in the making.

You will find that clear night skies produce heavy dews; a dry lawn goes with lowering night skies and a strong possibility of rain the following day. •

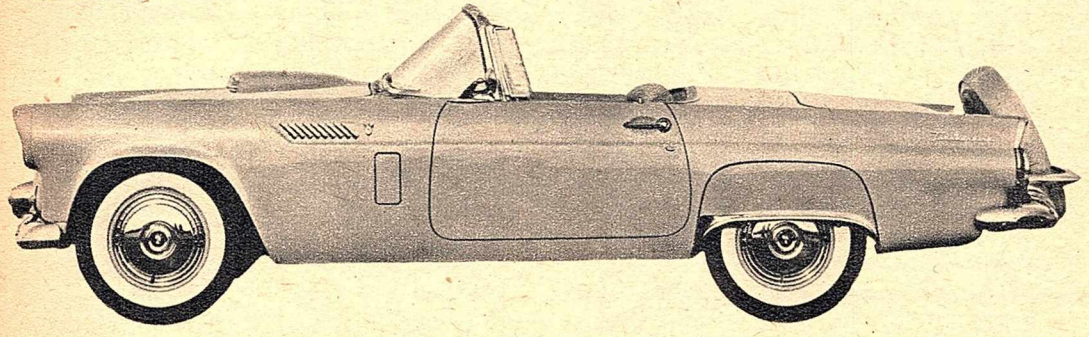


1. When the whole sky clouds with webby stratus, you are usually looking at the topmost head of a warm front that will get to you in about ten hours. 2. A little later you may see the sun or moon wearing a big halo as it shines through high ice clouds. 3. When the sun or moon looks like a big dull blob through altostratus cloud, rain is about six hours away. 4. The nimbostratus or rain-mass of the warm front clouds produces a longer and slower rain than the quicker cold front cloud structure does. 5. In the wake of a warm air-mass you will always find haziness, moist air, poor visibility and slower, steadier winds. Notice that all the warm front clouds are ceiling-like stratus in shape. They flow over you like an elevated mist. Only the purging action of a cold air-mass can dry and clear warm air-mass atomsphere.

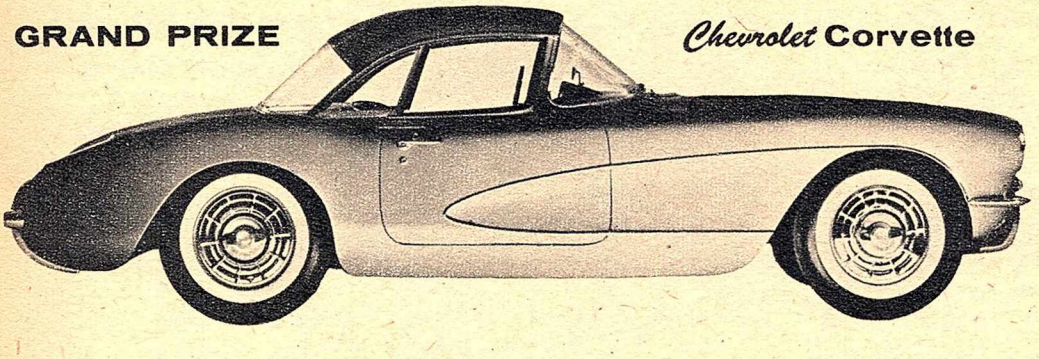
MI's Exciting $20,000

Win a Sports Car...

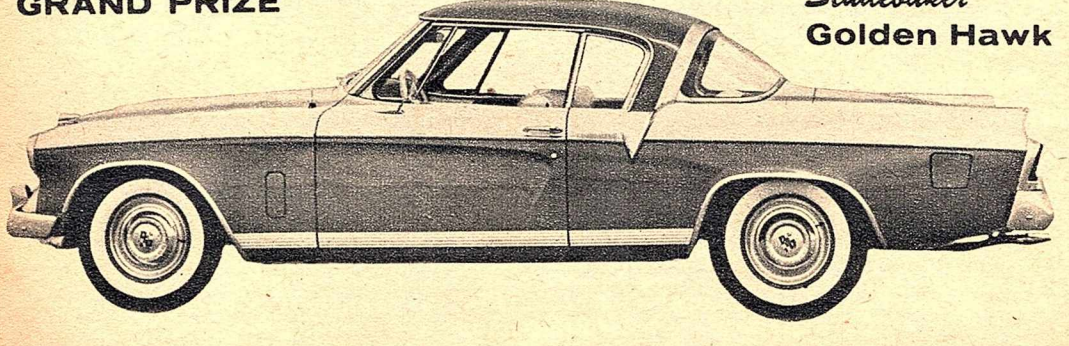
GRAND PRIZE *Ford* **Thunderbird**



GRAND PRIZE *Chevrolet* **Corvette**



GRAND PRIZE *Studebaker* **Golden Hawk**



Highway Safety Contest

...Dozens of Other Great Prizes

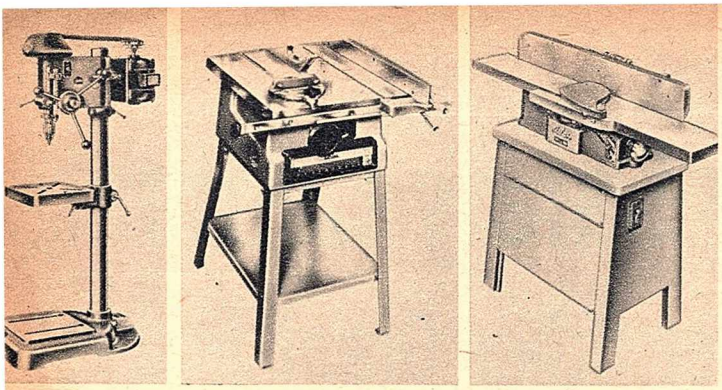
HERE'S what you've been waiting for! MI presents the biggest and most exciting contest in its long history, giving you a chance to win your choice of three great American sports cars. Also on our prize list are beautiful boats, power workshops, outboard motors, cameras and many, many other awards. For those who didn't place in our Buildwords Contest last year, here is a fresh opportunity to hit the jackpot for a Ford Thunderbird, Chevrolet Corvette, Studebaker Golden Hawk or some other valuable prize you've always wanted! You'll find the $20,000 Highway Safety Contest is easy and fun, too.

4TH PRIZE

Chris-Craft's beautiful new 22-ft. Express Cruiser! Big cabin sleeps four, has galley, dinette, toilet and berths. Uses inboard or outboard power, does up to 27 mph. Kit is worth $1,141.

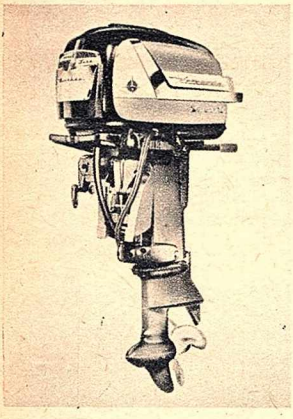
Complete Rules and Entry Blank On Pages 80-81

For Pictures of Other Prizes Turn the Page



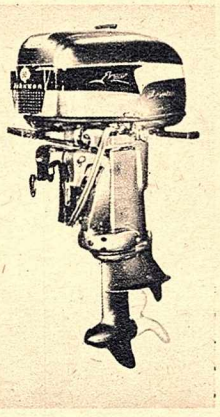
5TH PRIZE

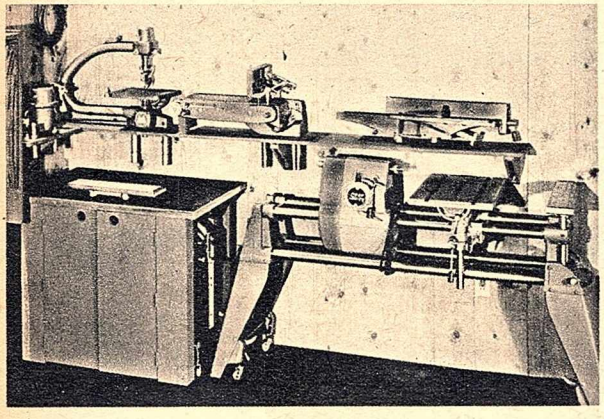
A famous Atlas woodworking shop of rugged power tools, worth $597.35. Consists of heavy-duty floor type drill press with motor (left), the 8-in. tilt-arbor circular saw with stand and motor (center) and 6-in. precision jointer with stand and motor (right).



6TH & 7TH PRIZES

Two 30-hp outboard motors, the Johnson Javelin and the Evinrude Lark. Each of these great silent-running, twin-cylinder power plants is worth $582. Complete with fuel tanks and electric starters. Winner No. 6 has his choice.





8TH PRIZE

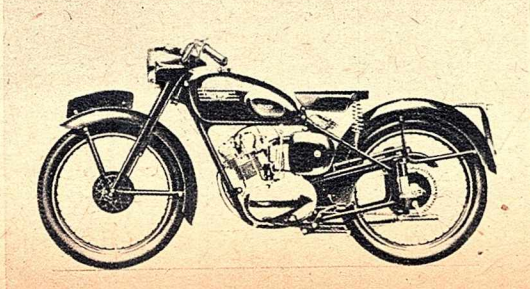
The home shopman's delight, a complete Shopsmith outfit! The five precision-engineered power units are worth $489.30. Includes a Shopsmith Mark 5 plus the 4-in. jointer, big 18-in. jigsaw, 6-in. belt sander and compressor-sprayer.

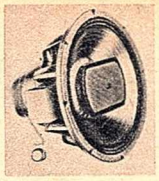
9TH PRIZE

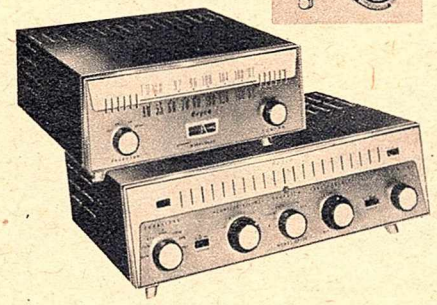
Custom Craft 15-ft. Thunderbolt runabout. Seats 6; finished, ready for water—$485.

10TH PRIZE

Speedy Triumph Terrier motorcycle, robust British lightweight; 4 speeds, $462 value.





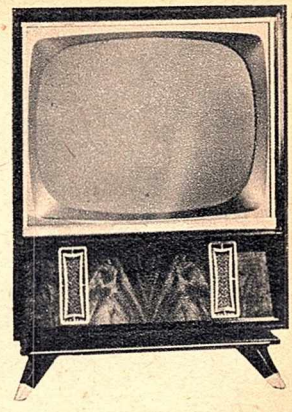


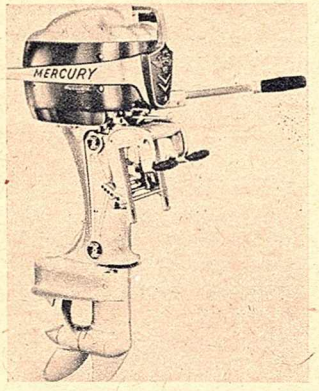
11TH PRIZE

Superb hi-fi set by Bogen, gives very best in music. A complete $434.45 outfit: AM-FM tuner, an amplifier unit, triaxial speaker and the transcription player.

12TH PRIZE

Lovely Philco Miss America 24-in. TV set in mahogany. Top-Touch Tuning, Remote Control—$399.95.



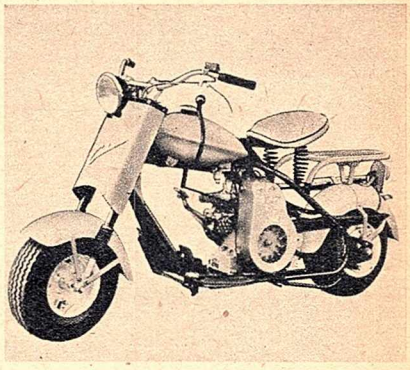


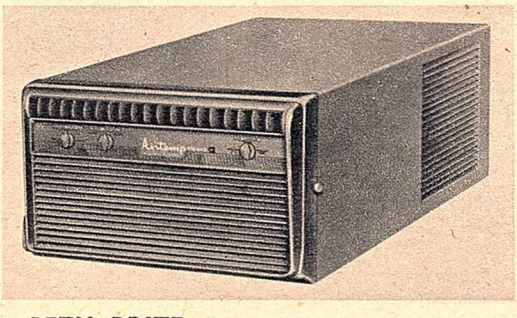
13TH PRIZE

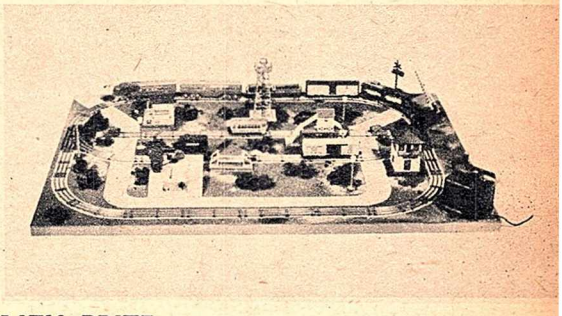
A quiet but powerful 20-hp Mercury Mark 25 outboard. Dyna-Float Suspension, fuel tank; worth $395.

14TH PRIZE

Flashing new 1956 Cushman Eagle 5-hp motor scooter. Coiled spring ride, Husky engine—$355.





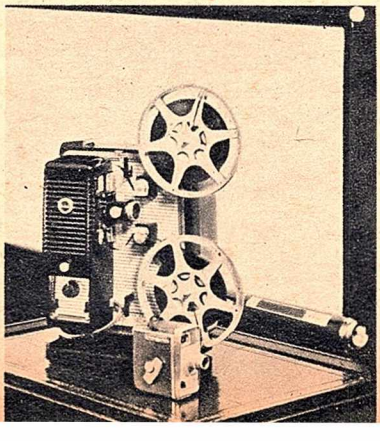


15TH PRIZE

Chrysler Airtemp Conventional Deluxe ¾-hp air conditioner for 500 sq. ft., $314.95.

16TH PRIZE

A complete Lionel train set. Landscaped, assembled, ready to go; nine units—$300.



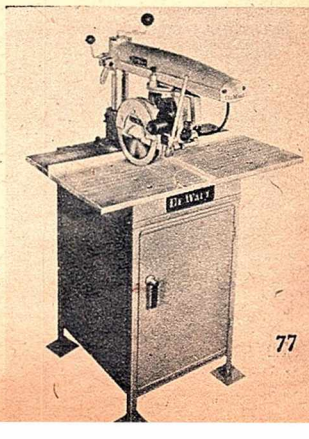
17TH PRIZE

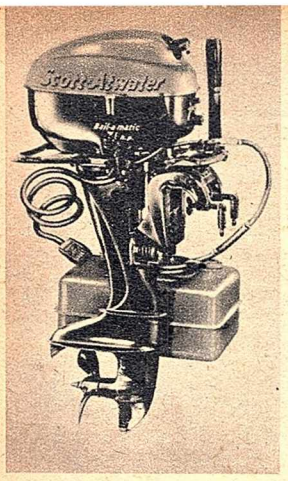
Eastman Kodak's $286 movie set, everything you need: Medallion 8mm camera, the Showtime projector and 40x30 Radiant screen.

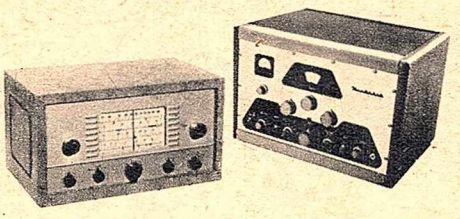
18TH PRIZE

A handy DeWalt MB-F Power Shop machine, ¾-hp motor, 9-in. blade, guard, steel cabinet; $280.90 gem.

Continued Next Page



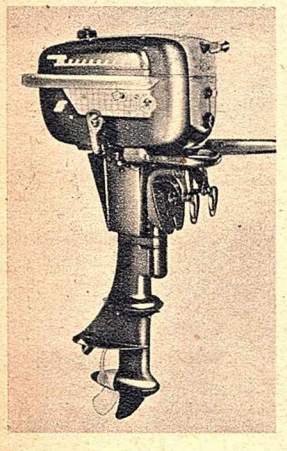




19TH PRIZE
Husky 7½-hp Scott-Atwater outboard, a boatman's pal. With famous Bail-a-matic, Aquamute and tank—$239.50.

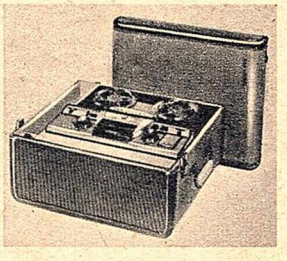
20TH PRIZE
Heathkit's $236.95 ham rig of DX-100 phone & CW transmitter kit, 4-band receiver and the Grid Dip Meter kit.

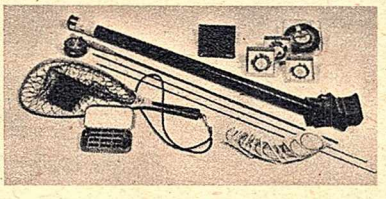
21ST PRIZE
A world-renowned Rolleiflex Automat with f-3.5 Schneider Xenar lens, Synchro-Compur shutter and case; $234.50.



24TH PRIZE
Brand new RCA Victor hi-fi tape recorder, The Judicial. Three speakers, two-speed, portable. Worth $199.95.

23RD PRIZE
U. S. Plywood's fine set of Kalistron his-and-hers luggage by Belber—$200.





25TH PRIZE

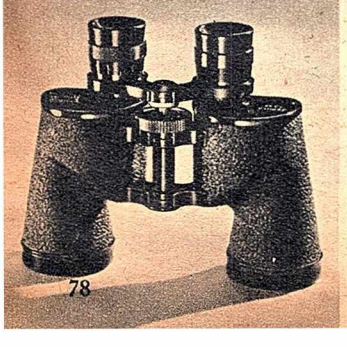
22ND PRIZE
Deluxe Gale Buccaneer 5-hp outboard; quiet, full gear shift, tank on head; $205.

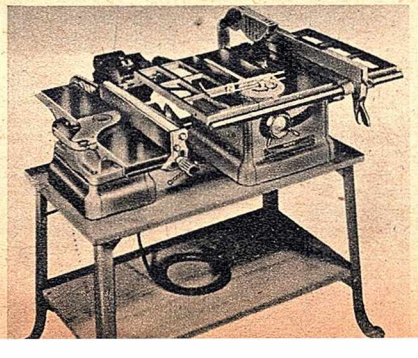
Delightful $184.25 Orvis fly fishing kit: Deluxe 2 pc. rod, Hardy reel, 4 dz. flies, leaders and case, Aerofloat line, Wheatley fly box and net.

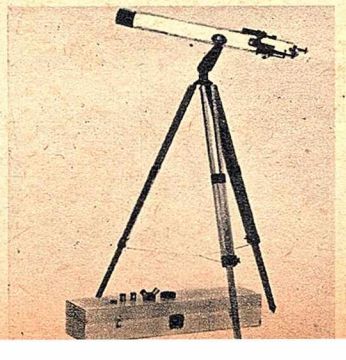
26TH PRIZE
Highly prized Bausch & Lomb Zephyr-Light 7x35 (7-power) binocular, in leather case, straps. Valued at $170.50.

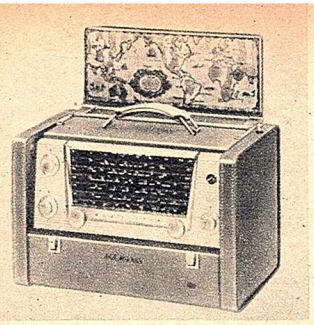
27TH PRIZE
Duro's jack-of-all-trades, the saw-jointer combo unit, does almost any woodworking task. Without motor—$160.

28TH PRIZE
Criterion 60mm T8 telescope; 40x, 64x and 89x eyepieces, case, right-angle adapter, 3x finder and tripod; $145.





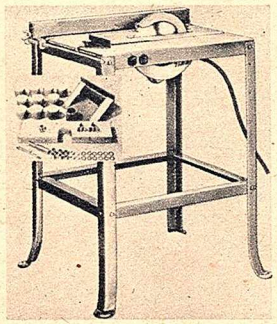


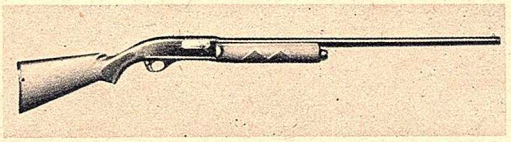


29TH PRIZE
Remington's brand new 30-06 autoloading high-powered big game rifle with walnut stock, has light recoil, clip; $144.30.

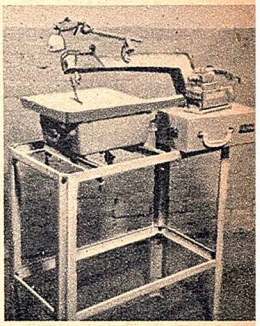
30TH PRIZE
Strato-World II, RCA Victor's beautiful new all-band portable priced at $139.95.

31ST PRIZE
Detectron $135 DG-7 geiger counter with separate probe, a versatile prospector.



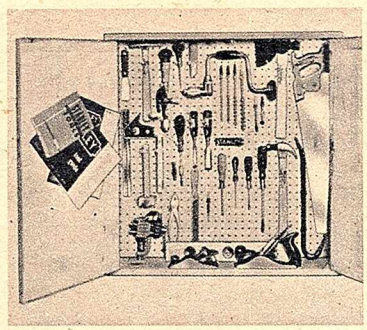


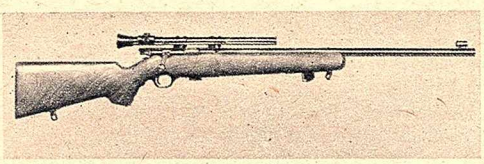
34TH PRIZE
Special grade Remington autoloading shotgun, choice of gauge, choke; 4-5 shot; $130.60.



32ND PRIZE
Renowned Skil Saw plus table and a sander-shaper—$131.85.

33RD PRIZE
Syncro professional-type jig saw with bench, lamp; plus the sander; $131.80.

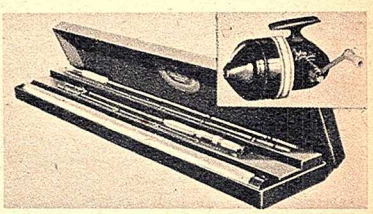




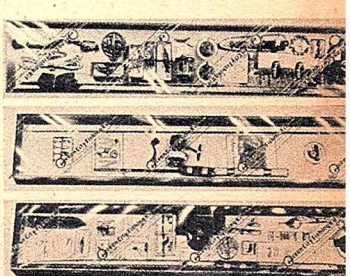
36TH PRIZE Mossberg .22-cal. target rifle with a 4x telescopic sight, 20x spotting scope and stand; worth $105.80.

35TH PRIZE
Stanley's finest hand tool kit, tools for every home job; $106.

37TH PRIZE
Pair of fine matched Presidential rods in case plus a SpinCast reel with line from South Bend — $103.50.



38TH PRIZE
Three complete fishing kits from Ocean City; for bait-casting, fly fishing and spinning; $100 value.



39TH PRIZE
Thor 56KC SpeedWrench, with ½-in. drive, steel case, 6 sockets; it also drives screws, drills—$100.

It's easy to win one of these great prizes. Turn the page, read the rules and start solving the puzzle now!

Rules for MI Highway Safety Contest

Read All of Them Carefully Before Starting on Puzzle

1. The MI HIGHWAY SAFETY CONTEST is composed of four puzzles: No. 1 in the May 1956 issue of MECHANIX ILLUSTRATED, No. 2 in the June issue, No. 3 in the July issue and No. 4 in the August issue.

2. Complete all four puzzles, trying for the highest possible score. In scoring, add the letter values on each horizontal line and place these sub-totals in the boxes marked LINE TOTALS. Then add LINE TOTALS to get your score for each puzzle. (See Sample Puzzle and How To Win.)

3. Write your score for each puzzle in the MY SCORE box. Write your total score for the four puzzles in the box marked GRAND TOTAL on Puzzle No. 4; *also write this Grand Total in the lower left corner on the address side of your envelope.* PRINT your name and address on each puzzle in the spaces provided.

4. You may submit legible *copies* of the first three puzzles. But Puzzle No. 4 must be clipped from the August 1956 issue.

5. The four completed puzzles—pinned, paper-clipped or stapled together—must be mailed in the same envelope. *Do not mail puzzles separately.* Do not include anything in the envelope except puzzles. Print your name and return address in the upper left corner on the front of your envelope, then address it to:

MI HIGHWAY SAFETY CONTEST
FAWCETT BUILDING
GREENWICH, CONN.

6. The final authority on acceptance of words used in the puzzles is the latest (1953) edition of Webster's New Collegiate Dictionary. Any *complete* word defined in the main section of this dictionary (pgs. 1 through 997) may be used—EXCEPT possessives formed with an apostrophe (e.g., *girl's*); hyphenated words (e.g., *post-mortem*), proper nouns (names), or abbreviations. Plurals and other accepted forms (such as past tense) of words may be used. The same word may be used more than once in the same puzzle or in different puzzles. All words must read from top to bottom or from left to right.

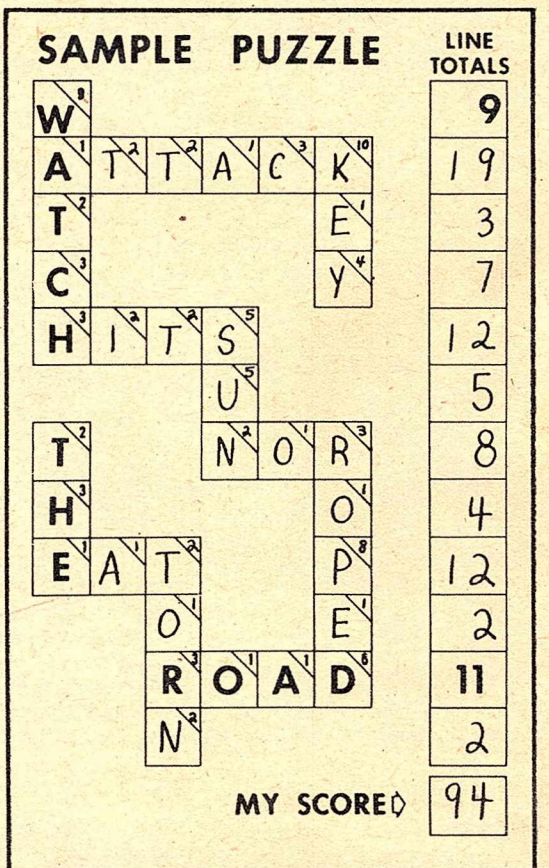
7. Entries must be postmarked not later than September 1, 1956. No entry will be acknowledged or returned. All entries become the property of Fawcett Publications, Inc.

8. The three contestants having the highest scores will win Grand Prizes. The contestant with the highest score will be given his choice of a 1956 Ford Thunderbird, a Chevrolet Corvette or a Studebaker Golden Hawk. The contestant with the second highest score will have his choice of the other two cars. The contestant with the third highest score will win the remaining car. Other prizes will be awarded accordingly, with fourth prize going to the contestant with the fourth highest score, etc. Originality, neatness and legibility will be judging factors in event of ties.

9. The Editors of MECHANIX ILLUSTRATED are the judges of this contest and their decisions shall be final. Correspondence will not be entered into with contestants concerning the contest, nor will telephone calls or telegrams relating to it be answered.

10. Contest is open to any resident of continental North America except employees of Fawcett Publications, Inc., its wholesale distributors and advertising agencies, and their employees and families.

11. The winners will be notified by mail and their names will be printed in a future issue of MECHANIX ILLUSTRATED.

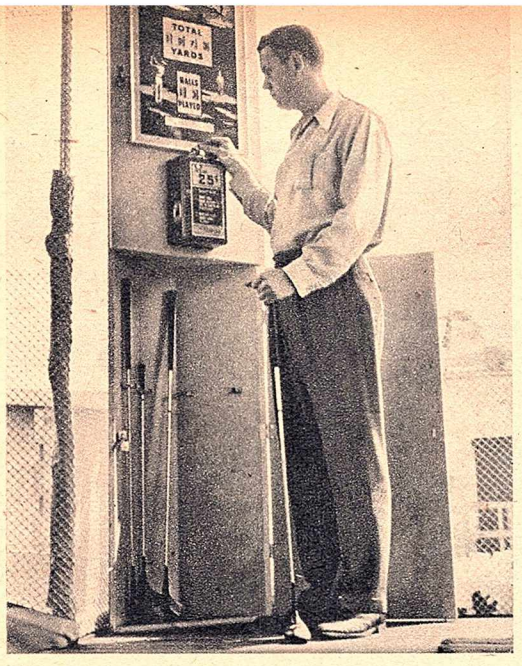


LETTER VALUE CHART

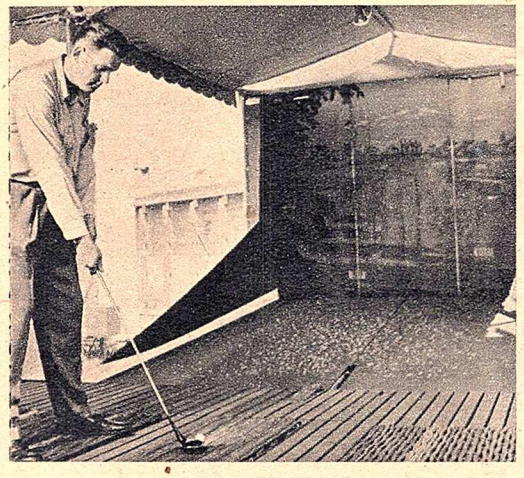
A-1	F-2	J-7	N-2	R-3	V-8
B-4	G-7	K-10	O-1	S-5	W-9
C-3	H-3	L-5	P-8	T-2	X-5
D-6	I-2	M-6	Q-10	U-5	Y-4
E-1					Z-1

AUTOMATIC DRIVING RANGE

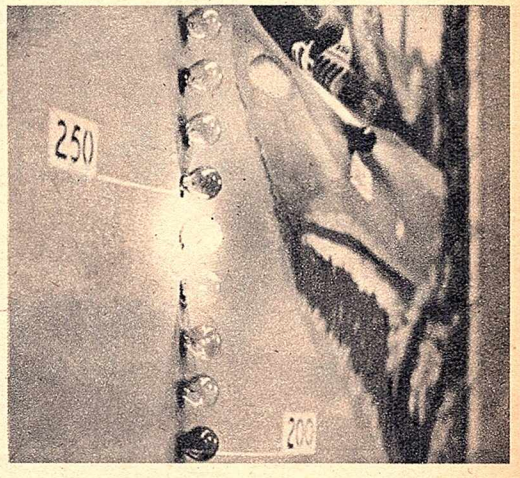
THE Golf-O-Mats at Palisades Amusement Park, N. J., are the world's first fully automatic driving ranges. Only 25 feet long, they still give the golfer the feeling of freedom he needs for serious practice; they also record distance, hooks and slices. •



Player drops in quarter, picks his club. First ball comes up at once on automatic tee.

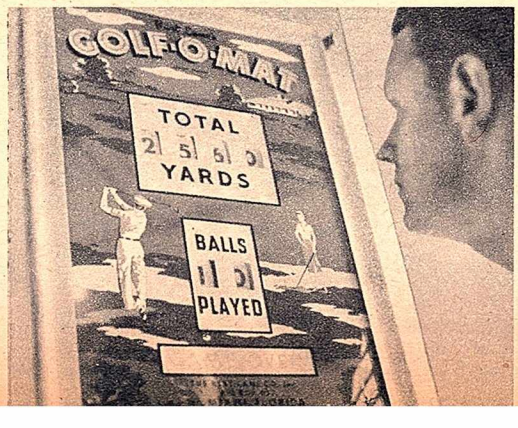


The vertical lines on the fairway backdrop will let him know if he hooks or slices.

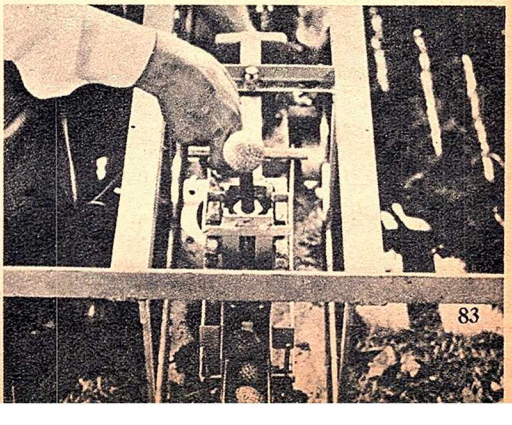


Light bulbs show distance of each drive as ball hits electronically activated backdrop.

Automatic scoreboard adds up total yardage, gives Golf-O-Mat its basic appeal.



Inner workings of ball return. Golf-O-Mat was designed by Bert Lane of Miami Beach.



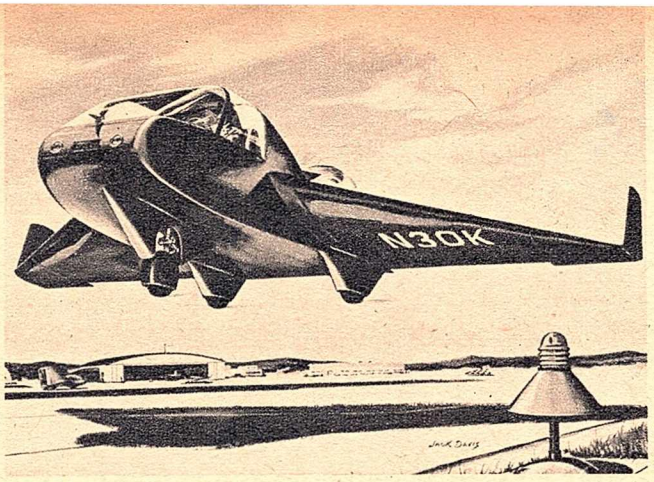
Harmon Trophy winner Coleman with a model of his 225-mph Aeromarine.

The Car-Boat That Flies

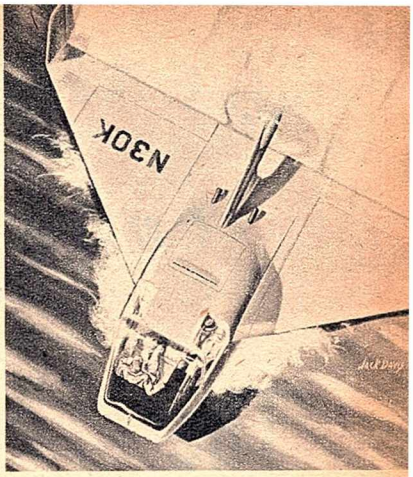
Skeets Coleman's three-way gadabout will be a performing fool and as easy to pilot as a '56 car.

THE GREAT advances in aircraft design of the past 15 years have had little effect on the looks or performance of the small private planes now being built; you could have landed any of them at a small airport in the mid-30's without scaring anybody. But with Skeets Coleman's Aeromarine design the field of private plane building may begin to catch up with the times.

The Aeromarine, which is still in the



Aeromarine's rear-mounted engine and prop will mean an unusually quiet cabin.



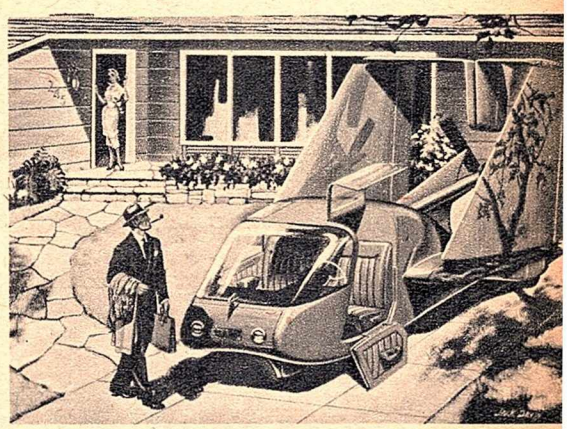
Ability to operate off water should insure Aeromarine's popularity among sport flyers.

workshop stages, will be a high performance plane that can be operated from land or water or driven like an automobile—making it ideal for the all-around week-end sportsman.

Compared to the many hybrids of this type that have preceded it, the Aeromarine has a convincing, unified look that you would expect from a man of Coleman's background and that takes it clean out of the Rube Goldberg class. Its modified delta wing structure in particular reflects Coleman's recent experience as test pilot on the Navy XFY-1 Convair Pogo, the vertical takeoff fighter. For his achievement in making the first-ever flights in this radical type of plane Coleman won the 1955 Harmon Trophy.

In his design Coleman has concentrated on creating a go-anywhere airplane—which meant cutting down on its performance as a car or boat. As a car it will be a power tricycle with a top speed of 50 mph. Power for humming down the highway will be fed to the rear wheels of the landing gear; steering will be through the single front wheel. As a boat—well, it'll float fine. If you want to go up the lake for more bait, why not let down the hydro-ski under the hull and make a short hop of it?

But as a plane the Aeromarine is expected to show considerable class. It will have a range of 800 miles on 80 gallons of gas, a top speed of 225 mph. Cruising speed, with five aboard, will be 200 mph. It will take off with a run



As a car it will be a medium performer with an estimated top speed of 50 mph.

of 800 feet, land at 57 mph. Simple controls and instruments, plus the stability and no-stall characteristics of the delta wing, will make flying easy for anyone.

One device designed just for the amateur pilot is a miniature delta wing mounted on a fulcrum on the nose of the Aeromarine. This "radiator ornament" will tell the pilot at a glance if his plane is in a safe altitude in relation to airspeed and wind—the most important thing to know when flying a delta wing.

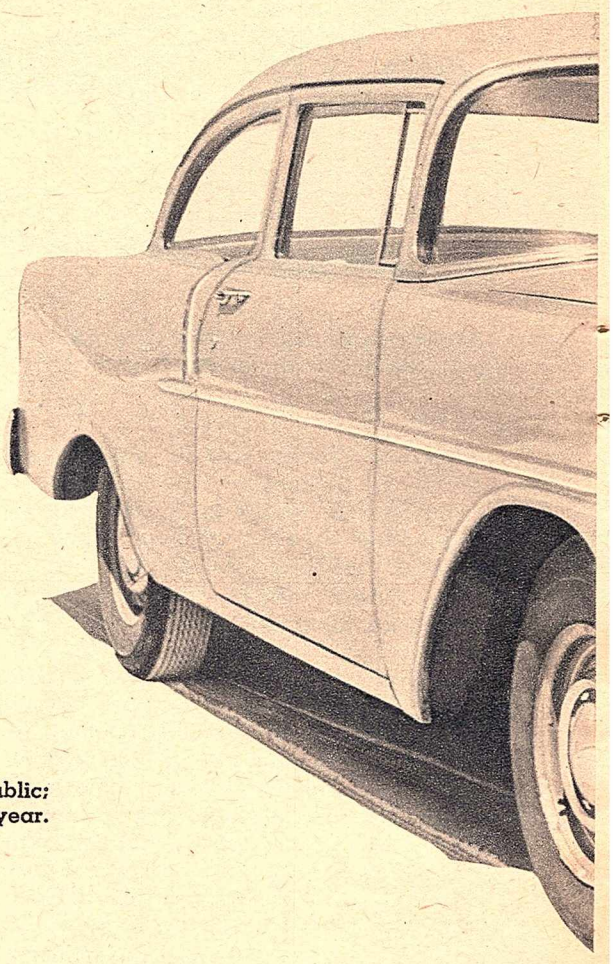
An extremely advanced feature for high lift on takeoff and landing will be a system for sucking boundary air off the leading edge of the wing. This will be an aid rather than a necessity; if the system conks out it will still be quite simple to land or take off safely. •

McCAHILL TESTS

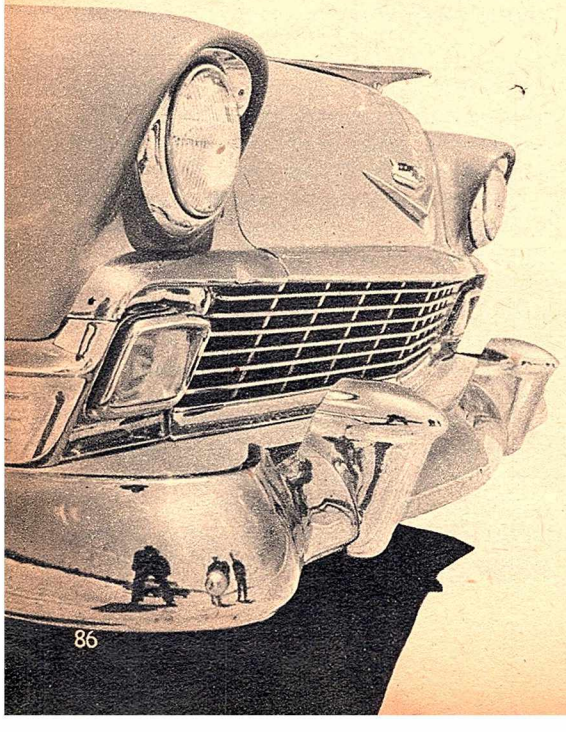
The Chevrolet

"The hot one is even hotter," Tom agrees after testing the '56 Chevy with "the best engine in the U. S."

By Tom McCahill



Chevy '56 design has clicked with public: the car is top seller in U. S. this year.

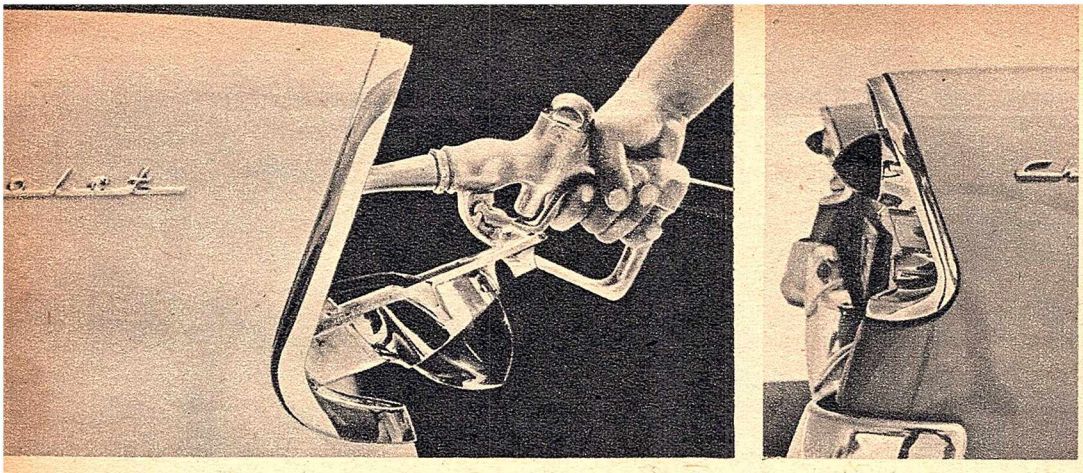


CHEVROLET has come up with a poor man's answer to a hot Ferrari. Chevrolet introduced its new V8 engine in 1955 and it quickly proved to be the hottest thing since Casey got locked in the steam bath. Here was an engine of only 265 cubic inches that, due principally to its fantastic breathing properties, can wind up tighter than the E string on an East Laplander's mandolin. These engines, when equipped with available kits, can reportedly develop one horsepower per cubic inch of displacement, though only rated at 225, and they can wind well beyond 6,000 rpm without blowing up like a pigeon egg in a shotgun barrel.

Sheriff Jack Tapscott loaned Tom his 150 sedan with 225-hp engine for the test.

The kit jobs (which consist of cams, two four-barrel carburetors and manifolds) are true engineering enigmas. Theoretically, according to some of the dopesters, they should blow—but they don't. At the Speed Trials at Daytona Beach one of these jobs which tossed a fan belt got through the traps one way at 136 mph, turning close to 7,000 rpm. This was a factory-sponsored car and was disqualified by me, as were several other Chevrolets that topped 130, because they all finished without fan belts. According to the rules—which are justified—a car entering a Speed Trial must have all standard equipment operating when it starts and when it stops.

In an engine that turns as fast as the Chevrolet it is conceivable that the instant the fan belt came off, the engine would pick up as much as 15-25 horsepower—not exactly cricket for the other contestants if allowed. We are not going into the cause of why the fan belts came off the four fastest cars but suggest that heavier belts are in order for the future.



Nicely designed taillight flips down for access to gas tank. With truly phenomenal acceleration (zero to 60 mph in 8.9 sec.) taillights are all other motorists see.

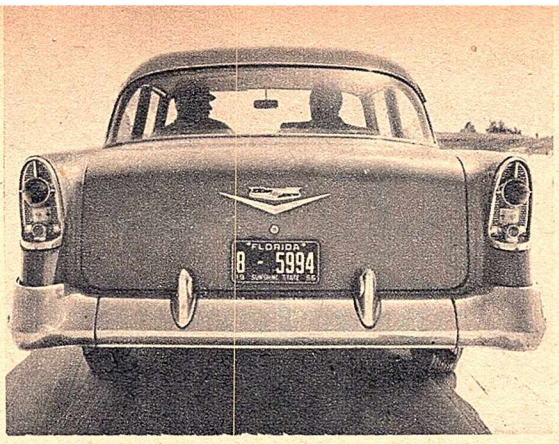
The eventual winner in the class was a Chevy owned and driven by Murray Hartley of Erie, Pa. He averaged 121.335 mph and his car kept its fan belt.

An old pal of mine, and last year's Daytona winner, Sheriff Jack Tapscott, was one of the entries I disqualified. Jack had a real tough break. Having heard before the runs got under way that there was a good possibility of some fan belt throwing, my inspectors checked some of them at the end of their first run and before the start of their upwind run of the measured mile. At the end of the first run, Jack, who had gotten down the beach at just under 133 mph, still had his fan belt operating. He told me later it was in operation all through the second leg and only whipped loose when he got off the accelerator too fast at the end of the trap to come into the compound. If he had backed off easier he might have kept the belt on, in which case he would have been an easy winner as his time was close to 130 mph. However, as he reached the compound without a fan belt, I had no choice but to give his entry the axe. Some of the others I disqualified were, to put it quite mildly, extremely miffed but we ruled "equipment failure."

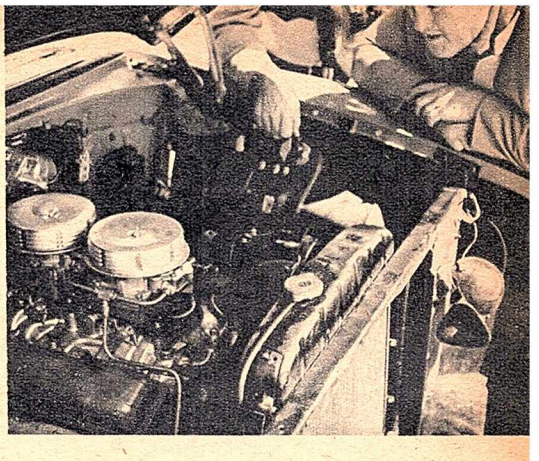
After Speed Week I took a trip in my boat down to the Keys. When I returned almost a month later I phoned Jack and asked him about the chances of testing his hot tomato. All you readers know about the regular Chevrolets that go backward and forward, like other cars, but not too many know about the real wildcats.

Let's face it, Chevrolet outsmarted the competition in bringing out a kit that was available on any model they build including the cheapest. You weren't forced to buy a Daisyglotten Superheterodyne Leather-Cushioned Deluxe Dilly before you were allowed to buy their hottest engine. Chevy made them available even in the broom peddler's special which I consider to be a genuine stroke of sales genius. Chevrolet made it possible for a guy who could get two thousand dollars' credit to buy a car that would run the ears off a majority of sports cars and whiz by everything from a traffic light (and I mean *everything*) as though the competition was running on four flat tires. The car that Tapscott drove is the standard 150 Chevrolet two-door with the 225 engine and gearshift. This means that Herman the Short Note Specialist can challenge the biggest guy in the saloon to a fast duel down the turnpike and few cars selling for even double the money will even keep his taillights in sight.

When Jack showed up with the car, we first ran it on the beach and then headed for some hardtop stuff for true acceleration times. When you jump the accelerator on one of these crickets, even on a glue surface, the wheels spin around like a Waring Blendor and the moment you make contact you shoot



Chevy 150 lacks lush appointments of Bel Air but is available with the top engine.



"Absolutely perfect camshaft" and a light valve train make this mill the greatest.

ahead—*zoom!* You blast up the road as if you had a barrel of nitro in the tail. Zero to 30 mph averages 3.2 seconds, zero to 60 mph 8.9 and in 12 seconds you're doing 70 mph. This is just about May, June and July faster than the Chevrolets of just two or three years ago.

When these engines are put in the new Corvettes, which are hardly light by sports car standards, in straight line running they'll get up close to 150 mph. This is phenomenal by any book when you consider that the Corvette weighs better than 2,600 pounds. Recently, in races with hard corners and where torque is a deciding factor, the Ford, with a much larger displacement engine, has been giving these cars a hard time (as it can out-torque the Chevy) and has been whipping them quite consistently under these conditions. However, down the turnpike or away from a red light, no car selling for under $3,000 can hold a candle to the Chevy.

Where does it get all this speed and performance? First, it is light in weight when put on the scale against its competitors. Second, it has the finest breathing engine ever built in America and a camshaft that is absolutely perfect. These engines depend on high rpm for their performance, 6,200 and up. This would have most other American engines exploding if their valves hadn't started floating some 600 rpm earlier. Ed Cole, who designed this engine, deserves a [*Continued on page* 169]

SPECIFICATIONS

MODEL TESTED:

1956 Chevrolet 150 two-door sedan

ENGINE:

V8 cylinder; bore 3.75 inches, stroke 3.00 inches; maximum torque 270 foot pounds @ 3600 rpm; brake horsepower 225 @ 5200 rpm; compression ratio 9.25 to 1

DIMENSIONS:

Wheelbase 115 inches; overall length 197.5 inches; tread 58 inches front, 58.9 rear; width 73.4 inches; height 60.5 inches; weight 3,155 pounds; standard tire size 6.70x15; gas tank 16 gals

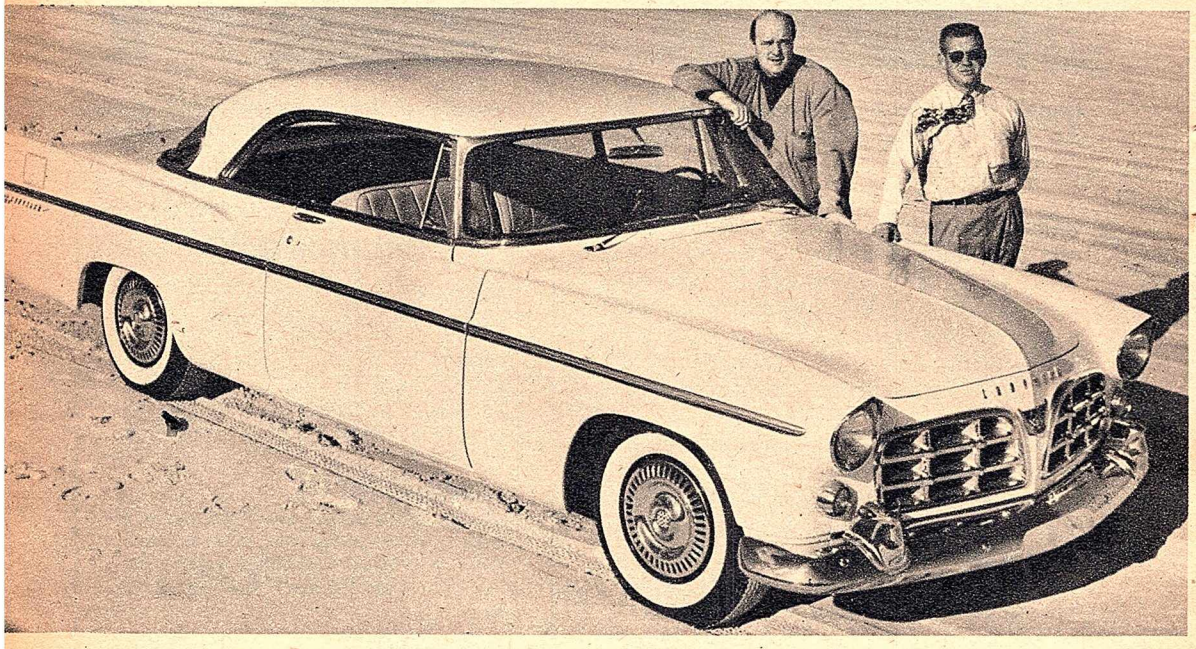
PERFORMANCE:

0 to 30 mph, 3.2 seconds
0 to 50 mph, 6.5 seconds
0 to 60 mph, 8.9 seconds
0 to 70 mph, 12.0 seconds
Top speed, 120 mph, plus plenty, depending on tune

Fine handling could be improved, in Tom's opinion, by stabilizer bar in front end.

McCAHILL TESTS

The Chrysler 300B

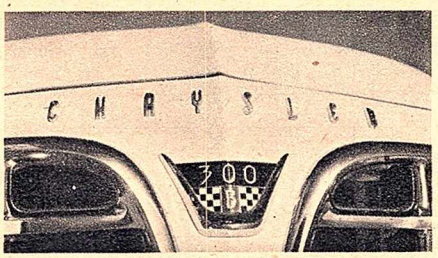


Due to its de-chroming and lack of gee-gaws the 300B is one of the handsomest and most

IN FEBRUARY 1955, two Chrysler 300's made their debut at the Daytona Beach Speed Trials and everyone who watched them perform agreed that it might be a long time before another full-sized sedan got over the beach so fast. These original 300's had automatic transmissions and made several runs of better than 139 mph, with a winning run of over 127. What would they do with a stick shift?

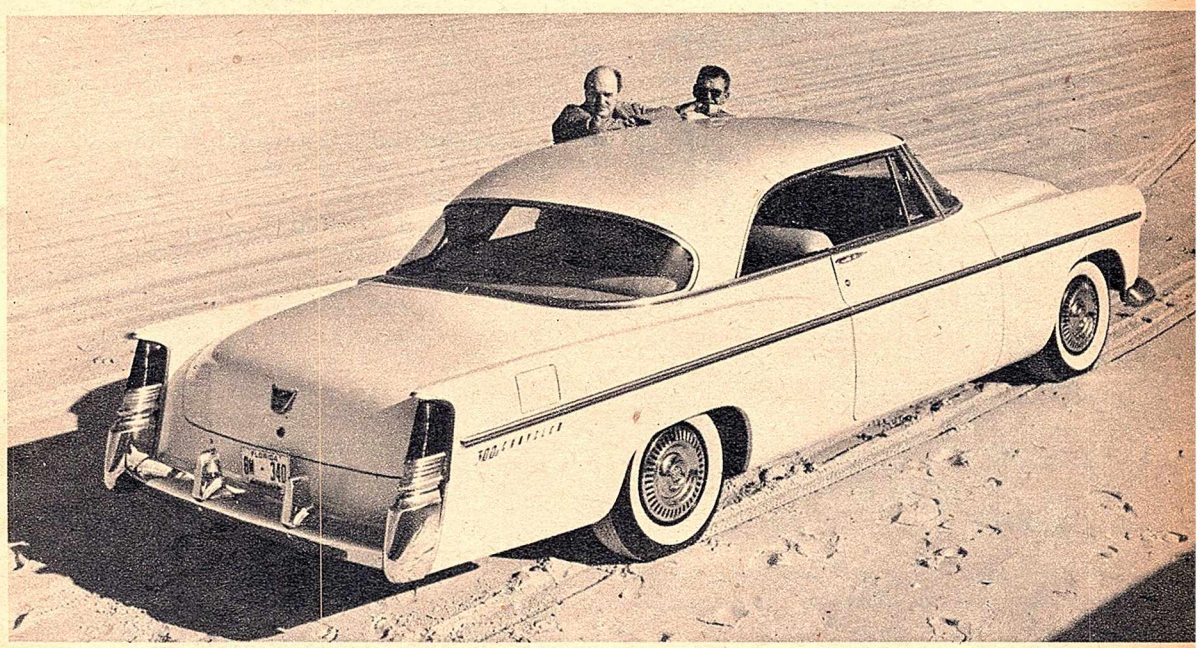
The answer came a year later with the introduction of the new Chrysler 300B. The 300B has an even larger engine than the original 300 and boasts 40 more horsepower. This year they were equipped with manual transmissions. Incidentally, I would like to point out a ridiculous trend that only Detroit is capable of producing. As all you boys and girls older than a medium-sized smelt know, automatic transmissions almost since their introduction have been extra-cost equipment. Well, with the Chrysler 300B a *manual* shift now costs approximately 70 bucks more than one with the Chrysler pushbutton twirler. Ah, progress!

Before the Speed Trials this year I got hold of Brewster Shaw's new 300B with stick drive. This particular car didn't feel quite sharp. It had very few miles on it so Shaw set about building these up. But on the day the Speed Trials became official, Shaw and Warren Koechling (who won last year) pulled a slight technical goof. Under the impression that the engine would put out enough



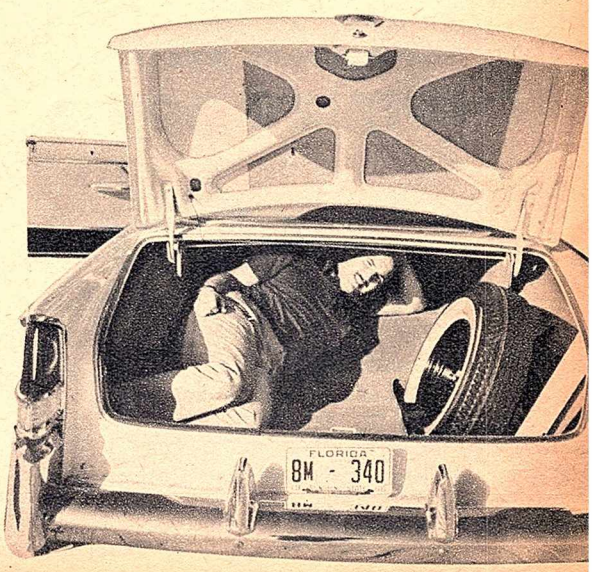
"A mastodon of muscle" is what Tom calls the powerhouse on wheels that broke the speed record at Daytona.

By Tom McCahill



expensive-looking cars on the road today, says Uncle Tom, shown here with Brewster Shaw.

torque and power to swing the optional 3.07 rear axle, they shifted from the original 3.54 equipment and this was their undoing. The beach, though smooth, was heavy and there was a strong wind blowing from the north that had to be met head-on in the final run of the two-way average. Consequently, Shaw's time was slower by almost a mile than last year's winning time and Koechling topped his last year's winning time by less than two mph. But Tim Flock, driving another Chrysler 300B, broke the '55 record by 12 mph at a 139.373 average through better gearing



Noted trunk-tester Jim McMichael has room aplenty in oversize cargo space.

Cars are bunched at the start of the Grand National at Daytona. At finish, Tim Flock in 300B is way out in front, having averaged 90.836 for 152 miles.

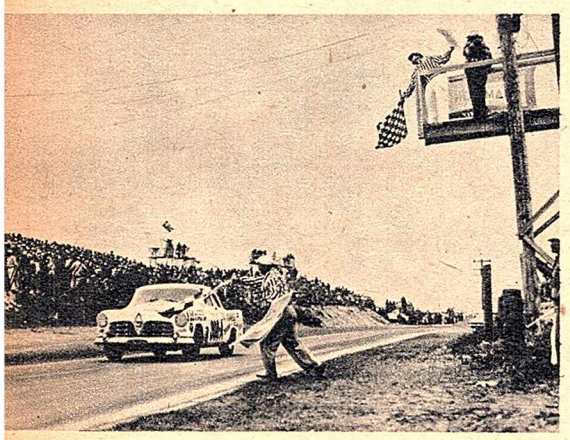
and a magnificently prepared engine and chassis.

The Chrysler 300B stick shift was a disappointment to me. It gave a lot more snap, once in the gears, but the box was awkward and rough to operate. Slam-shifting was a strict gamble as the slots were as hard to enter as the Racquet & Tennis Club in a football suit. This cost Shaw the winning of the MECHANIX ILLUSTRATED Standing Start Mile a day or so later. Shaw made a magnificent start but in trying to power shift from first to second he missed the gate by a gnat's mustache, consuming perhaps two-tenths of a second, and he was beaten out of first place by a Dodge 500 by just 1/100th of a second!

This gearshift also had a flimsy shift lever that instilled in the driver who was slam-shifting as much confidence as he'd have in trying to stop an elephant stampede with a spitball. It was not a smooth box but by the time you read this it'll probably be ironed out.

As any automobile man smarter than a sloth must realize, the Chrysler 300's and 300B's were designed more or less as special-purpose vehicles right from their inception. The purpose was to build the fastest full-sized deluxe sedan ever conceived. With this car Chrysler put every sedan ever built, past or present, in the background from a performance standpoint. Few sports cars can top the Chrysler 300B in a straight line run. But in accomplishing this Chrysler had to sacrifice some smoothness of operation.

These 300's are definitely not for a dowager duchess or an old maid schoolteacher. In fact, they are not for the average man at all. These cars are really for competition. Their two four-barrel carburetors, special manifolding and camming make their idling and low speed performance definitely on the rough side. These are competition cars in a full Brooks Brothers suit, no matter how you approach them. They

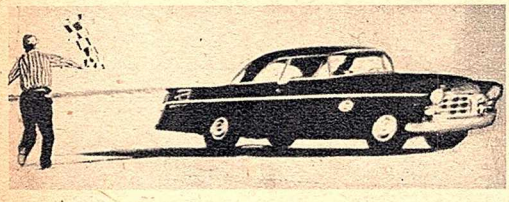


Chrysler took full-page newspaper and magazine ads to celebrate its triumph.

Let's get the record straight...

ONLY ONE
CAME IN FIRST
AT DAYTONA BEACH

CHRYSLER 300-B



Regardless of all the claims you may have read or heard, here are the official stock car results – the undisputable facts. At 1956 NASCAR Speed Week, Daytona Beach, Florida, the great new Chrysler 300-B

- **WON "FLYING MILE"** at **139.373** – m.p.h.
  1st – ahead of all other cars!
- **WON 160 MILE GRAND NATIONAL STOCK CAR RACE**
  1st – ahead of all other cars!
- **WON WOMEN'S NATIONAL SPEED TRIAL CHAMPIONSHIPS**
  1st – ahead of all other cars!

This is the second straight year Chrysler has made a clean sweep of these events – another first for Chrysler.

CHRYSLER 300-B . . . America's Most Powerful Car

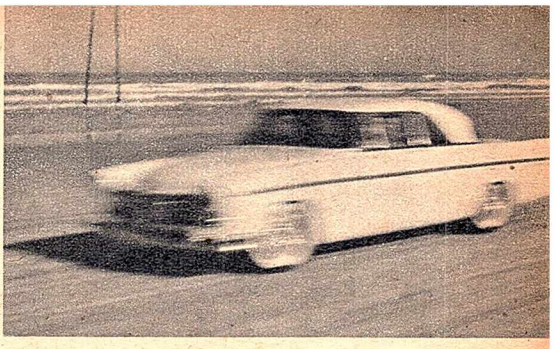
CHRYSLER DIVISION, CHRYSLER CORPORATION, 12200 EAST JEFFERSON AVENUE, DETROIT 31, MICHIGAN

are available with air conditioning, radios, phonographs, electric windows and all the plush accessories that no king ever had. But they nevertheless resemble a wild stallion, bridled and saddled.

Many men with more virile leanings in their transportation are going for these cars as they know they are buying several indisputable advantages. First, due to its de-chroming and lack of geegaws, the 300B is one of the handsomest and most expensive-looking cars on the road today. Its very appearance, even when parked, gives the impression that it is loaded with muscles, ready to spring into action the moment you flick the key. Tie this up with the fact that you know that no other sedan ever built can outrun you, and you have the perfect pride of possession that so many men desire. Never was there a better saloon talking-piece than the Chrysler 300B. When Whipsnead Sheehan juts out his puny chest to brag about his White Corpuscle Eight, the owner of a 300B can sear him like chicken feathers in a blast furnace with just a look.

Automotive competition being what it is today, you can order almost any variation on an expensive car, provided the order isn't too unreasonable and the dealer has enough influence with the factory to get it for you before you die of old age. With this thought in mind, here's how I'd personally order a Chrysler 300 or a Chrysler New Yorker. Let's say we decide on the New Yorker, which has the same basic 354-cubic-inch engine as the 300B. I'd order it with the solid valve lifters of the 300B, the 300 cam and a *single* four-barrel carburetor. With this combination I could stay with the Chrysler 300B up to well over 100 mph from a standstill, wheel turn for wheel turn, as my torque would be exactly the same. But at slower speeds around town I'd have a car as smooth as a vanilla ice cream soda that has been standing in the sun for ten minutes.

If I wanted the 300B (remember this is my personal choice) I would tell them to remove the two four-barrel carburetors and manifold and give me the New Yorker [*Continued on page* 174]



Not too terrific in getting underway, the 300B picks up fast in high speeds.

SPECIFICATIONS

MODEL TESTED:
1956 Chrysler 300B

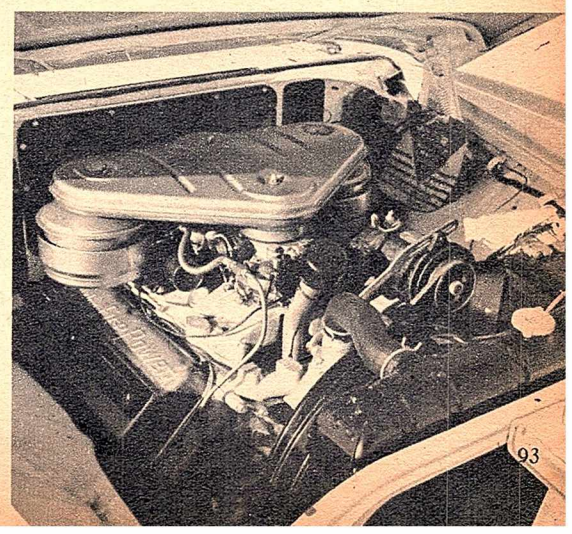
ENGINE:
V8 cylinder, OHV; bore 3.94 inches, stroke 3.63 inches; maximum torque 385 foot pounds @ 32-3600 rpm; brake horsepower 340 @ 5200 rpm; compression ratio 9.0 to 1

DIMENSIONS:
Wheelbase 126 inches; overall length 222.7 inches; tread 60.4 inches front, 59.6 rear; width 78.8 inches; height 59.4 inches; weight 4,145 pounds; standard tire size 15x8.00; gas tank 21.5 gals

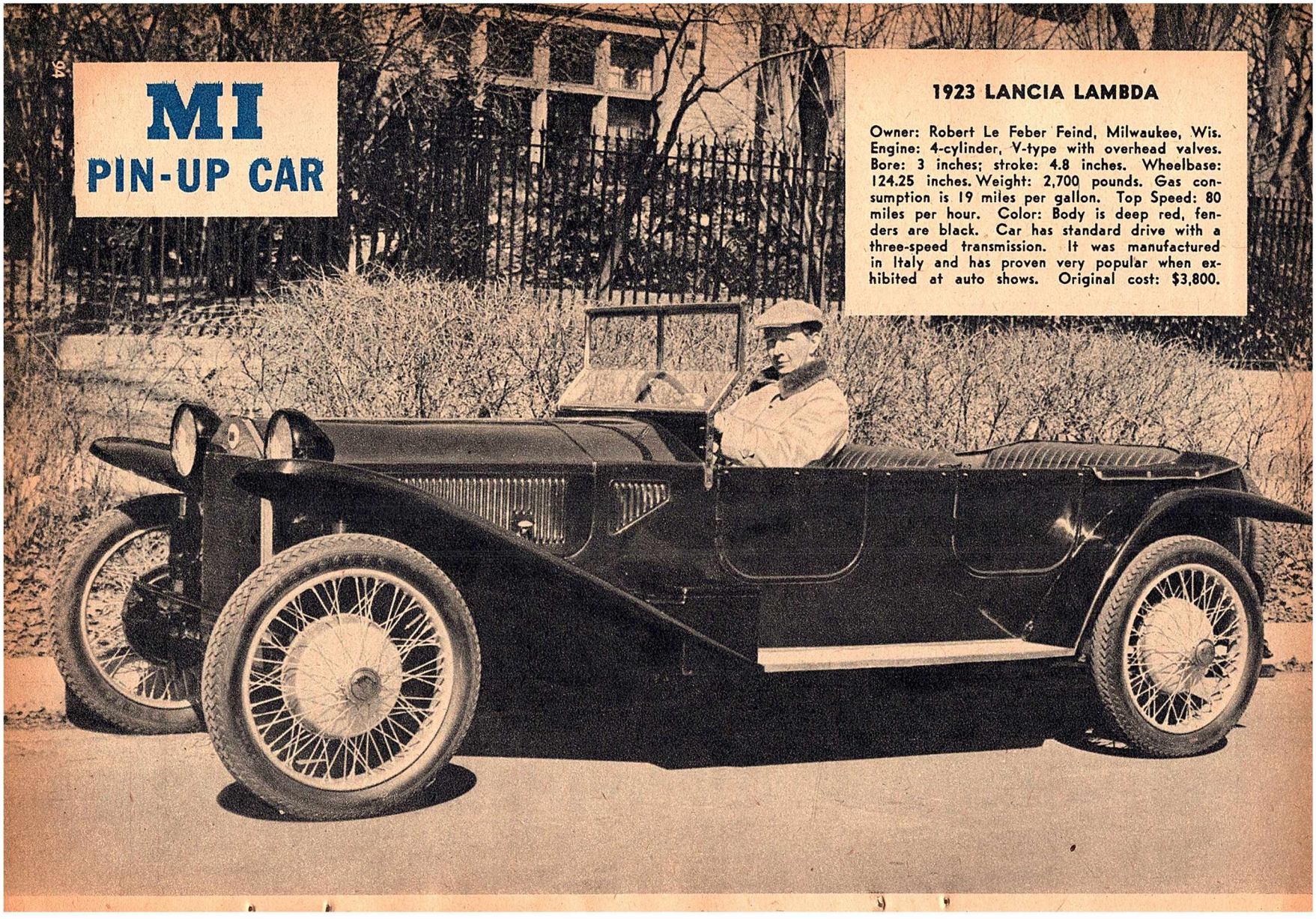
PERFORMANCE:
0 to 30 mph, 3.7 seconds
0 to 50 mph, 6.8 seconds
0 to 60 mph, 8.4 seconds
0 to 70 mph, 10.5 seconds
Top speed, 140 mph, plus

SPEEDOMETER ERROR:
At 60 mph on speedometer, actual speed 58.1 mph

Tom would prefer a single four-barrel carb for smooth low speed performance.

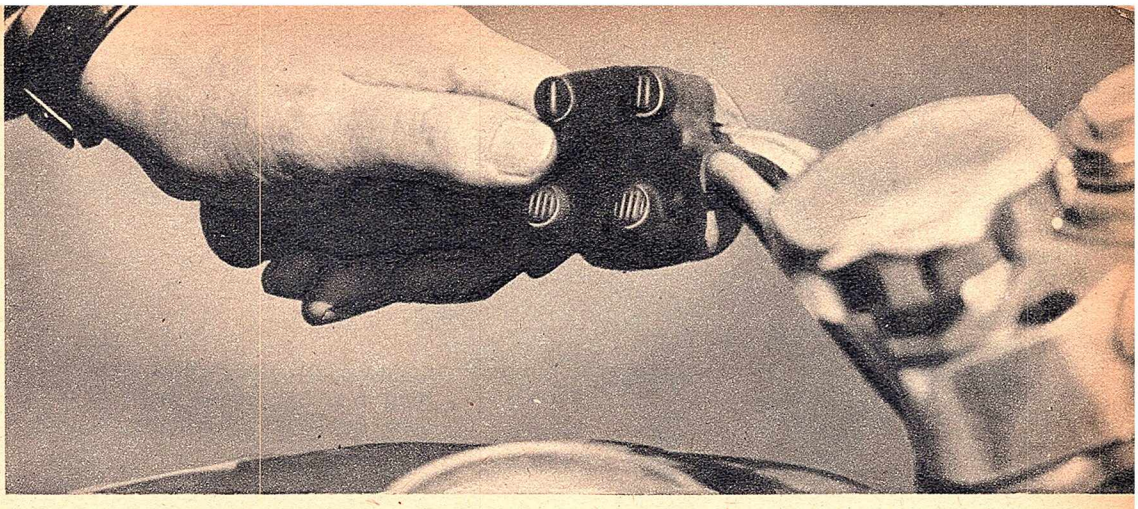


MI
PIN-UP CAR



1923 LANCIA LAMBDA

Owner: Robert Le Feber Feind, Milwaukee, Wis. Engine: 4-cylinder, V-type with overhead valves. Bore: 3 inches; stroke: 4.8 inches. Wheelbase: 124.25 inches. Weight: 2,700 pounds. Gas consumption is 19 miles per gallon. Top Speed: 80 miles per hour. Color: Body is deep red, fenders are black. Car has standard drive with a three-speed transmission. It was manufactured in Italy and has proven very popular when exhibited at auto shows. Original cost: $3,800.



Push-button box is located on handlebars of the new German Victoria Swing motorcycle.

PUSH-BUTTON MOTORCYCLE

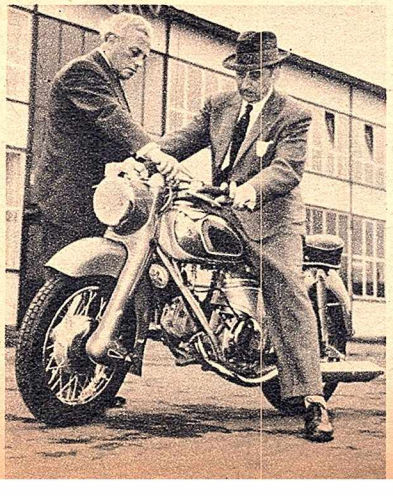
WIN $25

You can plunk $25 in the family bank account if you send in a sharp, glossy photo of an old-time car posed with the owner or a pretty girl. Car can even be new—if it is unusual. Include a self-addressed envelope (just in case) with all the vital statistics about car and owner to Pin-Up Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N.Y. 36, N.Y. You may win that $25.

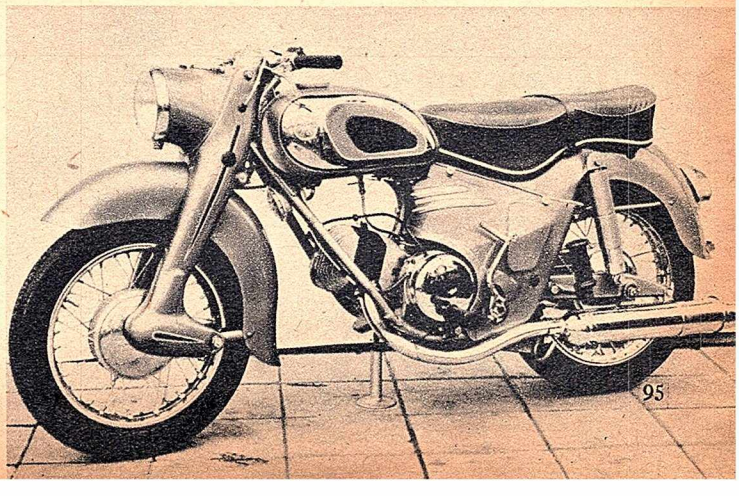
Latest German motorcycle features a unique electronic gear changer.

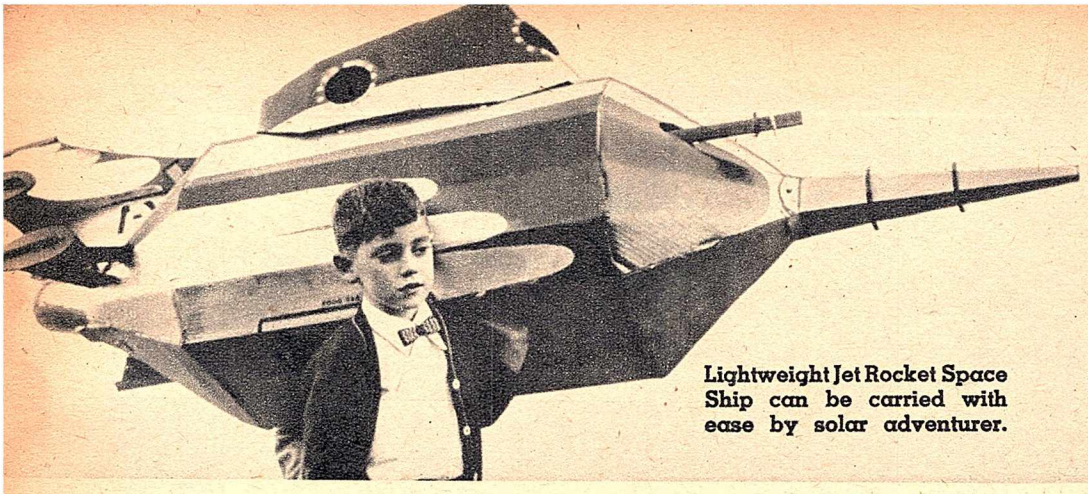
LIKE everything else these days, the new German Victoria Swing motorcycle boasts a fully automatic push-button control for its four-gear transmission. Unlike the push-button system on the latest American cars, however, the Victoria's works via electronics and makes extremely rapid gear shifting possible, according to the German manufacturer. •

American auto engineer, B. P. De Dube, hops aboard machine for a test run in Germany.



Motorcycle is the only two-wheel vehicle ever made with the push-button gear box.





Lightweight Jet Rocket Space Ship can be carried with ease by solar adventurer.

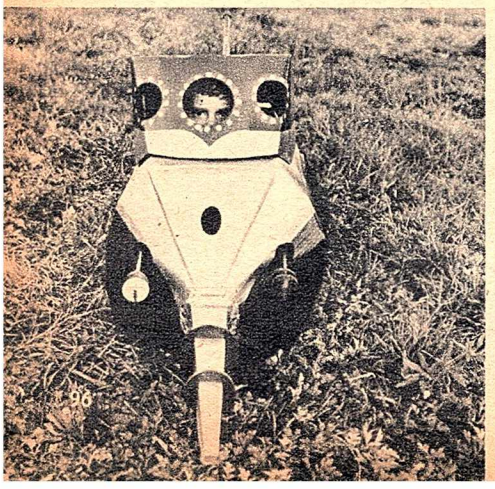
BACKYARD SPACE SHIP

THE space ship set among the younger generation will really soar when they see this seven-foot-long, two-seat jet rocket made of sturdy three-ply fiberboard. Easy to assemble, it can be obtained from the Honor House Products Corp., 35 Wilbur St., Lynbrook, N. Y. Pretty neat, huh? •

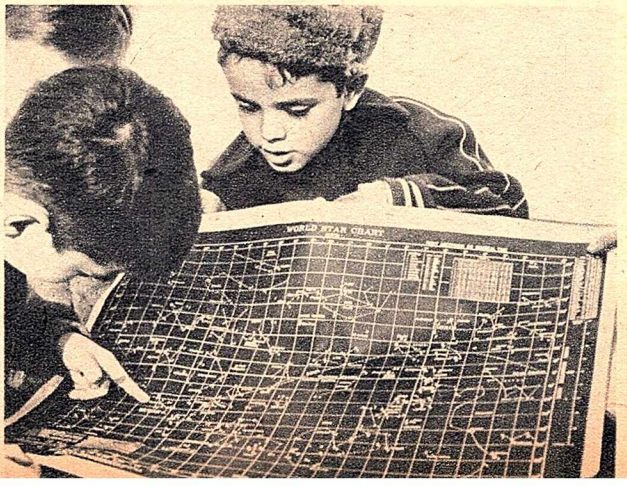
Streamlined craft has a hinged top which completely encloses crew inside the ship.

Instrument panel actually works and has a blast off button and jet steering control.

"Man the disintegrators and hang on to your Yo-yos, men. Here come the Martians!"



Astro-star map is must unless you want to spend your life floating about in space.



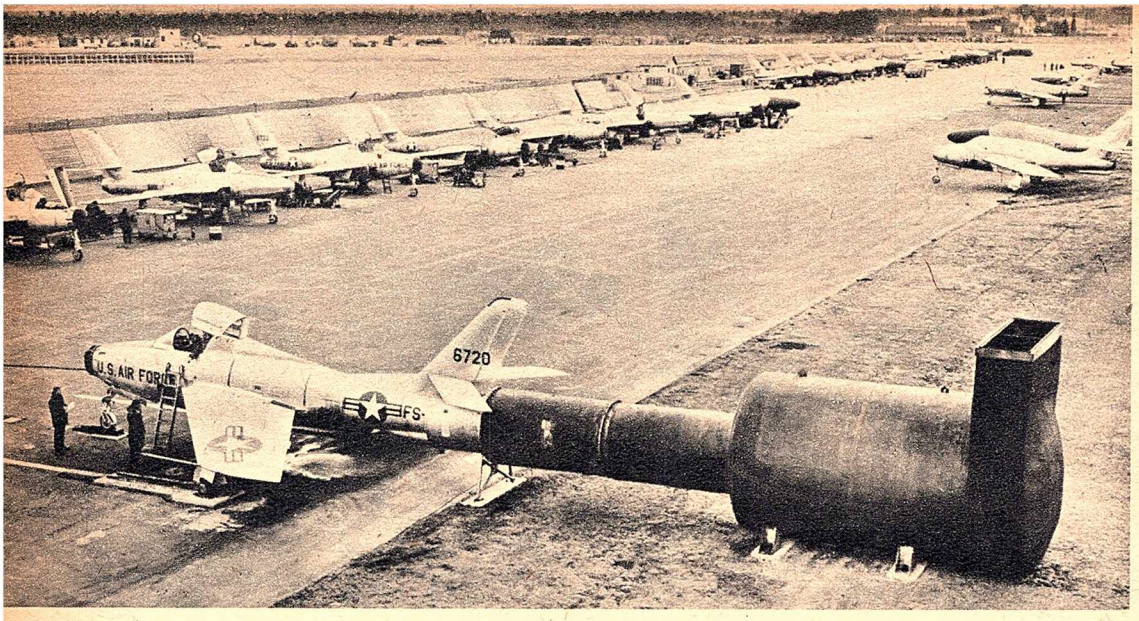
BELLYWHOPPER BICYCLE, demonstrated by its Italian inventor, Piero Moscogiuri, can do 50 mph with minimum exertion, permits easy breathing and "the fullest use of all muscles."

IT'S NEW!

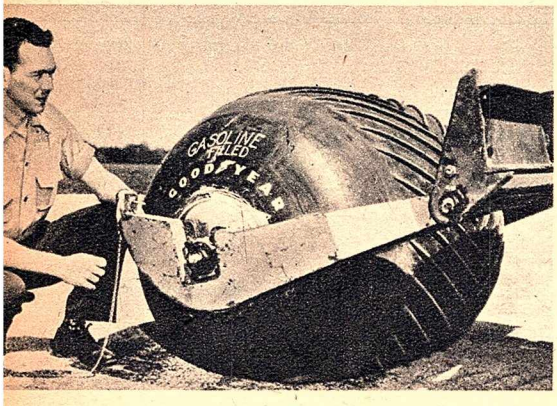
CIGARETTE GLOW was sole illumination for this TV photo after being amplified by new Bendix Aviation electronic device, Lumicon.

HOT TIRES trail clouds of burned-off rubber as test car hits turn at Ford Company's Arizona proving ground. The outrigger permits extra rolling for tire and steering tests.

CONTINUED . . .



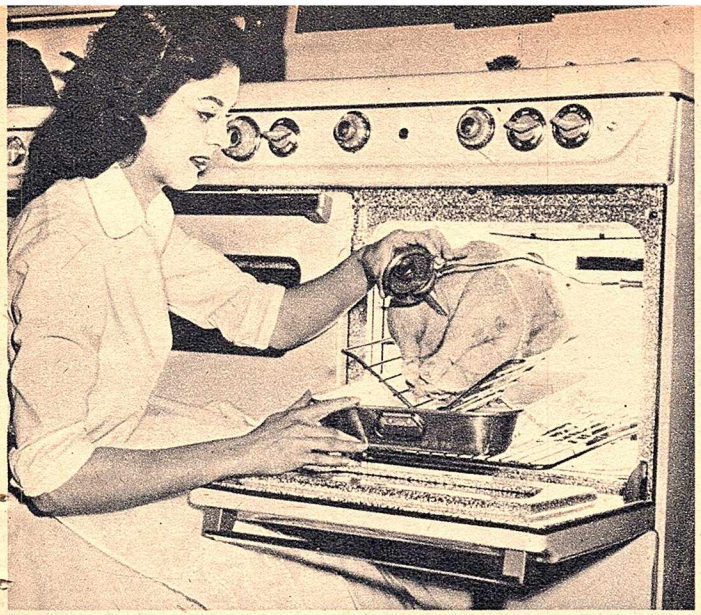
JET SCREAM MUFFLER built for Republic Aviation reduces sound level of jet tests to that of normal auto traffic in the area. Unit is "portable," less costly than earlier types.



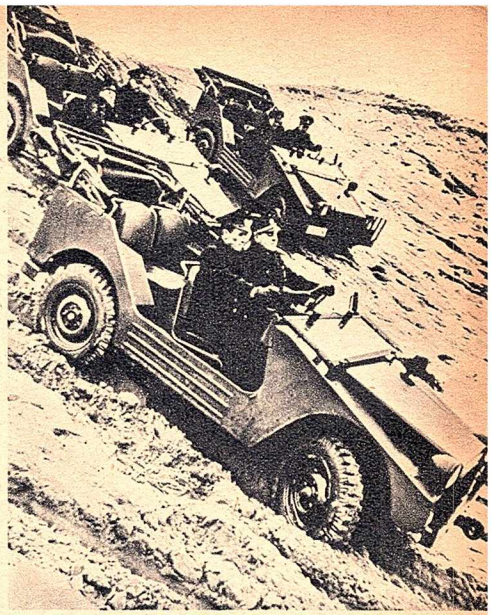
ROLLI-TANKER, Goodyear's answer to problems involved in storage and moving of liquids. It rolls, floats in water, takes a beating, can be towed by hand, car, tractor.

SMILE GAUGE helps dentists fit false teeth to facial contour. Daddy, why is the lady smiling so hard if she's going to lose all her teeth? Huh, Daddy? Why is she smiling—

HEEL REFLECTORS for night pedestrians who don't know enough to use left side of road—and who wear their pants pretty short. Seen at a German shoe exhibition.



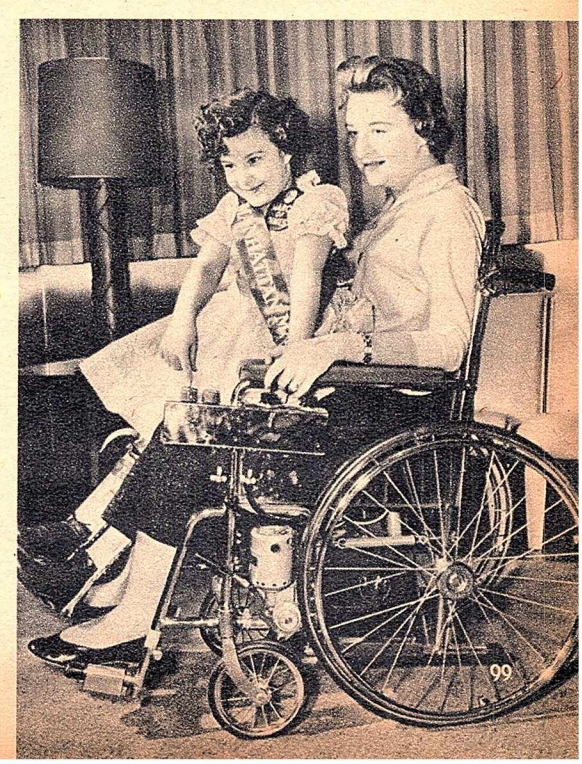
ROASTING CONTROL. Set dial, plunge probe into the bird, shut oven door and forget it—gas will go off when it's done. Works on any kind of meat or fowl roast.

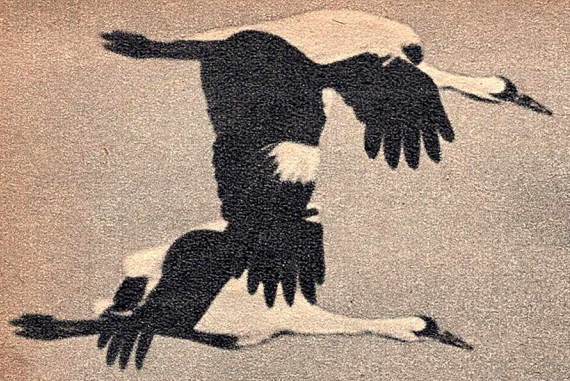


CROSS-COUNTRY CARS built for new West German armed services have two-cylinder engines, four-wheel drive, five synchronized forward gears, top speed of 60 mph.

URETHANE FOAMS, new DuPont material, can be used in myriad products from dish mops to dashboard crashpads foamed-in-place to eliminate separate cementing.

PUSHBUTTON WHEELCHAIR for paralytics does 6 mph, turns, reverses, slows down, has fingertip controls. March-of-Dimes subsidized New York group that developed it.





Expansion and progress—vital to the growing human race—have spelled the doom of many cherished species of birds.

By Lyman Gaylord

These Birds Are Real Gone

Once as numerous as the buffalo, the whooping cranes now number 21, will probably follow

DURING the course of evolution many of the most interesting flying creatures have disappeared completely because of their inability to adapt themselves to new conditions. The pterodactyl, a flying reptile, disappeared with the other great swamp dwellers like the dinosaurs when their natural habitat disappeared and with it the food they couldn't do without.

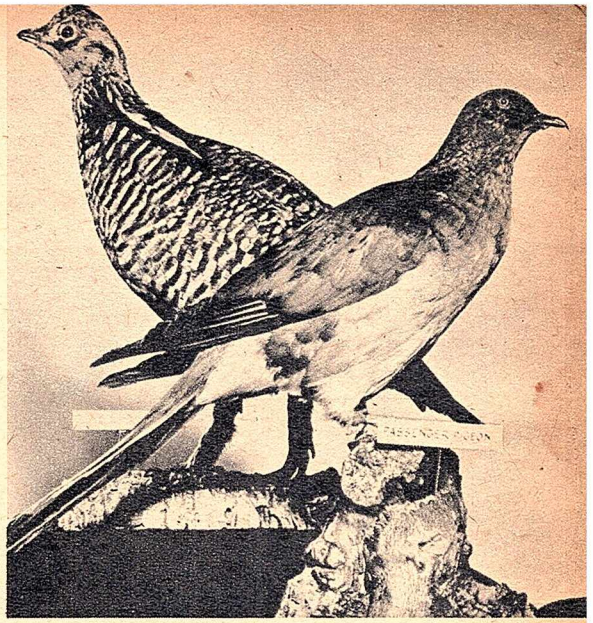
The California condor, a large, ugly scavenger, is another victim of what the naturalists call phylogenetic senility—the inability to change habits in order to avoid extinction. The condor lives on dead meat; in any wilderness this exists in abundance but nowadays when any of the 60 remaining condors finds a nice ripe carcass it's apt to be poisoned—not for him but for some four-footed predator.

The Everglades kite is in a similar jam. This small, hawk-like Floridian eats nothing but ampullaria snails. Draining the mosquito-infested swamps has killed off most of the snails and the kite population has dwindled to around 100—which may be wiped out quickly if conservationists can't maintain the ampullaria.

The heath hen, once common in New England and known as far South as the Carolinas, was the victim of its own mixed-up sex life. By 1880 only a few hundred were left huddled together in the comparative safety of Martha's Vineyard in Massachusetts. Conservationists set up a sanctuary on the island and prohibited further hunting on the mainland. A series of bad forest fires and raids by cats and hawks polished off all but 100 hens by 1917. After that the heath hens' friends noted with concern that the survivors were hatching a disproportionate number of males. Not only that but the males were sterile! The *coup de grace* was delivered when the remaining females decided not to have anything to do with the males, sterile or otherwise, and by 1933 the heath hen had disappeared.

Some birds flourish in a country dominated by man—the crow, for instance. Not so the ivory-billed woodpecker, which once made its home deep in the southern swamp forests. Heavy logging drove the bird from one breeding area after another until the existence of this brilliantly colored character (the largest North American tree driller) has become a matter of conjecture.

The bald eagle, inspiration of our national emblem, is found today in significant numbers in only two places: Florida and the Chesapeake Bay region.



the heath hen and the passenger pigeon (right), both of which disappeared in this century.

Fundamentally anti-social, the bald eagle (bald is a misnomer; the bird sports a full head of white feathers) has fled before the onslaught of settlers into the low lying coastal plains. Furthermore the bird has been plagued by lumberjacks cutting down the few trees sturdy enough to support the weight of its aeries which at times are composed of more than a ton of sticks and grass. There are fewer than 1,500 survivors at present.

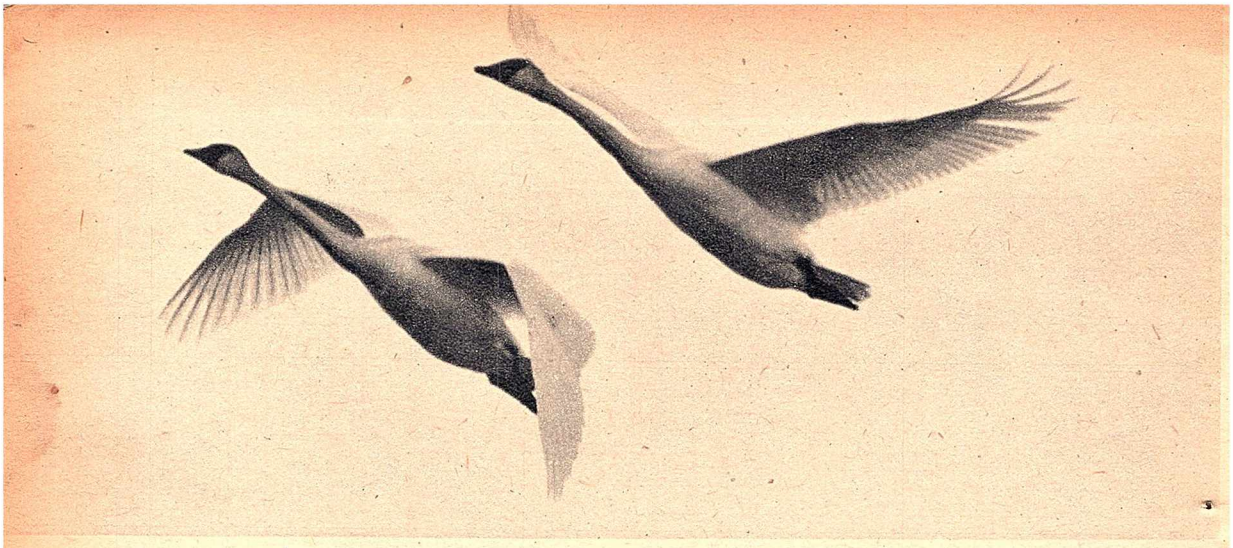
Pioneers crossing prairies encountered great flights of stately white birds which "stood as tall as men." Once common over much of the great American plain, and reportedly as plentiful as the buffalo, the whooping crane's end came with the draining and filling of the swampy prairie marshes that were his home. Whooping cranes can only be seen in two places today: on the Arkansas Wildlife Refuge on the coast of Texas and in a secret sanctuary somewhere north of the 60th parallel in Canada.

Nothing has been spared in the effort to save the whoopers which are now a matter of national concern. Thousands of dollars have been spent by the U. S. Fish and Wildlife Service and the National Audubon Society to maintain the Texas refuge; millions of words have been written in an attempt to educate the public to the plight of the whooper; oil companies have called off million-dollar drilling operations fearing that the birds would be disturbed. The location of the Canadian breeding grounds is kept a state secret.

In 1938 there were 18 cranes; by 1949 there were 37, but in the three years following it dropped to 21. When the migratory flock returned from Canada last year it brought with it three youngsters bred during the summer. The total was up to 24, but when the small band arrived in Texas this year, there were only 21 birds, all adults, meaning that the three young lost their lives or their way over the long flyway.

Once common over much of Texas and Louisiana, the prairie chicken was nearly annihilated in an orgy of killing that sent tens of thousands of birds to their deaths. The prairie chicken might have survived in more significant numbers if it hadn't insisted on flying in covies so thick that aiming wasn't necessary. An average day's kill for a party of sportsmen often exceeded the bird's present population of 8,500.

Between 1850 and 1920 the snowy egret and the roseate spoonbill were hunted mercilessly for their plumes. The



Trumpeter swan population was 50 in 1935; government protection has raised it to over 600.

hunters can't be blamed too harshly because they used to get up to $50 an ounce for the feathers, which is good money for poor swamp dwellers. When ladies lost their taste for feathered hats the slaughter stopped—not before. This story has a happy ending: the egret and the spoonbill have both recovered and the former is now a tourist attraction in Florida.

Snowy egret staged a fine comeback after the price for its plumes dropped to nothing.

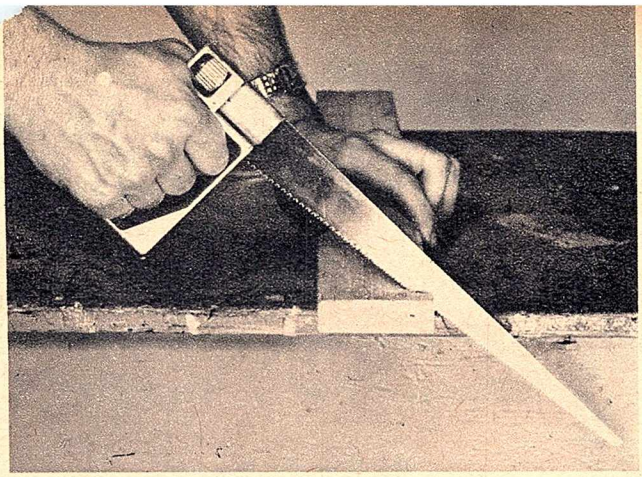
A chain of events conspired to eliminate the passenger pigeon. It began with the deforestation (by lumbermen and fire) of much of the northwest in which the pigeon made its home. Stripped of its natural food supply the pigeon aroused the wrath of farmers by cleaning out acres of freshly sown seed in a few seconds. Someone designed a net capable of catching over 3,000 of the birds at a time. To add to its many troubles the pigeon was a very slow breeder; it hatched only one egg at a time. In 1914 the last of the passenger pigeons died in the Cincinnati Zoological Gardens.

The conservation-minded citizens occasionally enjoy a temporary victory. The trumpeter swan, once given up as lost, is making a strong comeback in Red Rocks Lake refuge in Yellowstone National Park. Down to less than 50 in 1935 the big birds have fought their way up to a 1954 total of over 600.

The principle agencies concerned with the preservation of rare birds in this country are the Fish and Wildlife Service of the U. S. Department of Interior and the National Audubon Society, a non-profit group of civic-minded individuals. Both groups maintain and staff wildlife sanctuaries, distribute educational materials, engage in research and attend to the thousand and one details of aiding vanishing species in their struggle for survival. •

This month's

BRIGHT IDEA



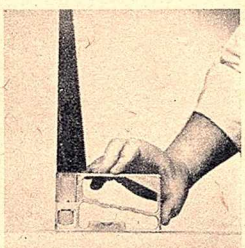
WIN $50

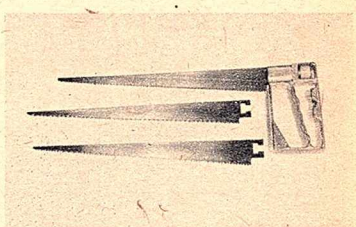
Seven-way saw will do almost any kind of cutting.

Dreamed up a neat gadget? If you're pretty keen about that pet project of yours, get busy and work it out in your shop. Then send pictures and a description of your invention to the Bright Ideas Editor, Mechanix Illustrated, 67 West 44 St., New York 36, N. Y. Each month the best entry gets a cash prize of $50.

7-Way Saw Set

THE NEW 7-Way Square-Level-Saw set just introduced by Harnell Manufacturing Company of New York is an ingenious time-saver for every do-it-yourselfer—Handy Andy and Freddie Fumbles alike. In a single precision tool are incorporated a dual level, an inside square, an outside square and an adjustable angle saw. It comes with three blades that will cut many materials including steel, wood, plastics, aluminum, frozen foods, plaster boards and panels of all types. The specially designed handle gives you a comfortable grip, complete protection for fingers and knuckles and allows the blade to be rotated to any cutting angle and held rigidly in place. •

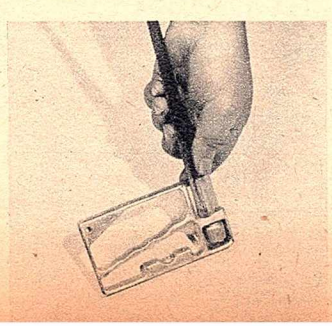


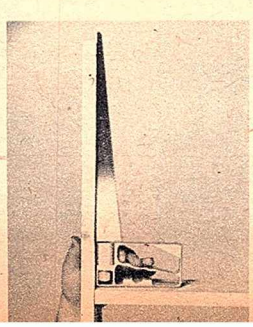


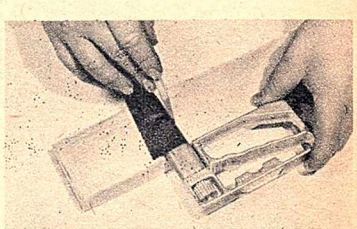
Top: level in handle can test vertical, too—just place back of blade against upright surface. Below: handle and blade set.

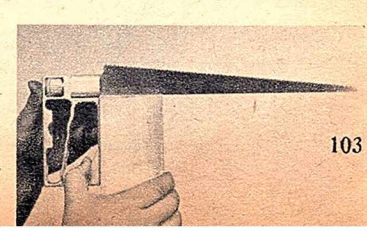
Below, the saw in use as a square marker, inside and outside square. Maker is Harnell Co., 105 E. 16th St., New York 3, N. Y.

Below, left: showing how blade can be rotated to any cutting angle. Versatile tool is a real bargain at modest price of $1.98.









HOW TO TEST YOUR

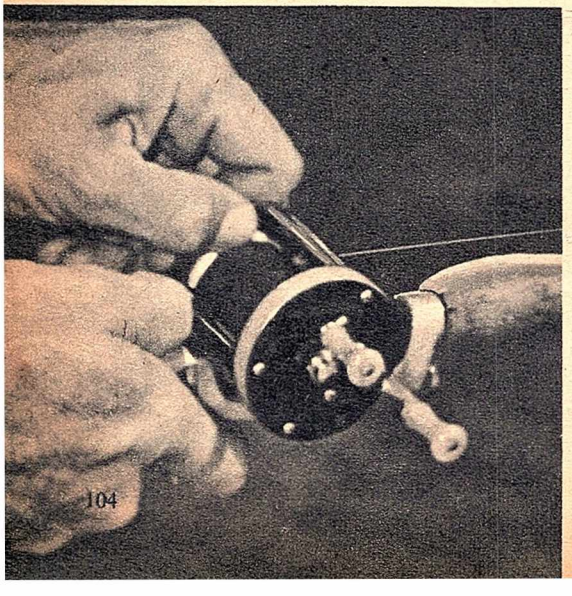
Author Martin struggles with a giant sea bass, one of many world record catches.

One of the country's top anglers offers some timely tips on how to select your gear for bigger bites.

By Roy H. Martin
***as told to* George X. Sand**

I STOOD in the sporting goods store and watched the man walk from one counter to the next. He was trying to decide which type of reel he needed to go with a bait casting rod that he had at home.

He finally selected a conventional level-wind model. Holding the reel in his left hand, he proceeded to "test" it by using his right thumb to spin the spool rapidly in the direction of what would have been the rod tip.



Pressure on spinning edge of metal spool, not line itself, will prevent burnt thumb.

Familiar test to see how free reel will run is waste of time, says expert Martin.

FISHING TACKLE

"Seems to run free, all right," he told the clerk. "I'll take it."

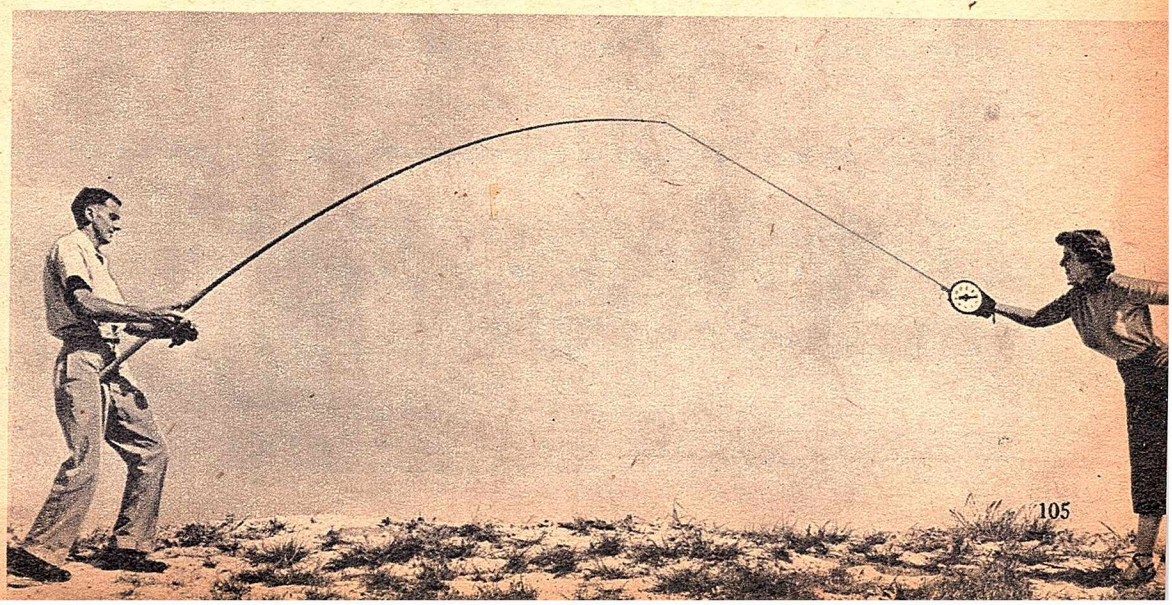
This man was wasting his time. The familiar spool spinning test is no test at all, regardless which way the spool may be spun, since a reel spool that spins too easily may actually be "heavy" and overrun when put to use, invariably causing backlashes to harass the owner.

Not only that, the man in this case made another big mistake by not bringing along the rod with which he intended to use the new reel. It is practically impossible to balance a reel to a rod, and vice versa, without having both items assembled as they will be when in use.

As one who holds more International Game Fish Association world angling records than any other man (seven at present) I have had ample opportunity to watch the costly mistakes of fellow fishermen who have not learned how to test their tackle properly before purchase and use. During the past decade, while I secured my present world records (I have held as many as 22 at one time or [*Continued on page* 175]

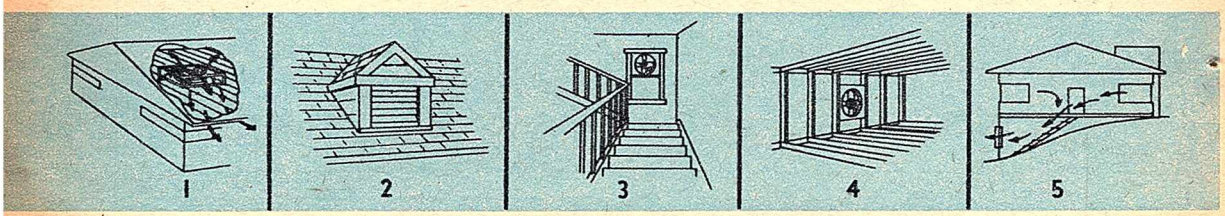
Poorly fitting waders will ruin a day's sport. Lift one knee; check for "binds."

Rod's give or line's breaking strength can be determined with a simple spring scale.



Low-Cost Cooling for Your Home

Properly installed, and of the right capacity, fans can cool your home at a fraction of the cost of an expensive air conditioner. **By Lyman Gaylord**



Shown above and at right are ten typical ventilating fan installations: (1) Under-eaves discharge. (2) In dormer window with automatic shutter. (3) In hallway

THERE'S no need to look forward to a summer of sizzling hot days and sweaty sleepless nights. A properly rated ventilating fan can give you many of the comforts of air conditioning at a fraction of the cost of an air conditioner. And, in addition, by ridding your house of moisture-laden and grease-filled air, a good fan—be it window, attic or kitchen type—will help keep your home or apartment clean.

For cooling, a ventilating fan works by pulling in cool night air through open windows, expelling hot, stuffy air that would otherwise remain inside. This means that your home gets a cool start each morning, helping to keep down daytime temperatures. Homes with adequate ventilation, users report, can be as much as 20° cooler at night and 10° cooler in the day.

A fan can also be used to circulate room air during either day or night, tending to make you more comfortable as you're cooled by convectional air currents. If you have decided to buy a ventilating fan, you'll find that you have a wide choice. There are over 90 manufacturers of ventilating fans in the country according to the trade journal, Electrical Merchandising. Last year, these firms sold over 2,000,000 units at an average retail price of $37 for kitchen units, to $131 for high capacity attic fans.

A good fan will give you relief from water vapor, air-borne grease, smoke, cooking odors and hot air. What would you say if you heard that your next door neighbor carefully sprayed his house with almost a quarter of a ton of grease each year and in addition, sloshed enough water to fill a swimming pool over the walls, ceilings and floors? Probably you would declare that he was utterly insane. But how about your own home? Do you know that 400 pounds of cooking grease and over 2,000 gallons of water vapor are added to the air inside the average home in one year's time?

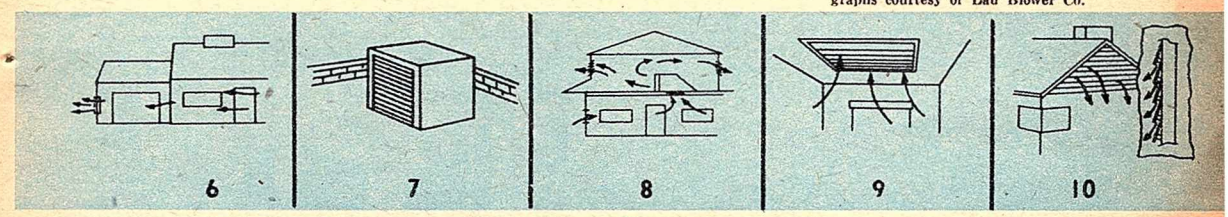
If some escape hatch isn't provided for all that moisture and grease, it's going to cause trouble and expense. Water vapor, for instance, will permeate the walls and cause timber rot; in closets it speeds destructive mildew and rust. The grease will settle on walls, ceilings and furniture in a hard-to-clean, unpleasant smelling film which can discolor even the brightest paint job in a few weeks.

There is, unfortunately, no way of knocking out this grease and moisture at the source unless you're willing to stop using the kitchen altogether and to stop breathing as well. In only 24 hours, one and a half gallons of moisture is contributed to the air by the breathing and perspiration of the average family of four.

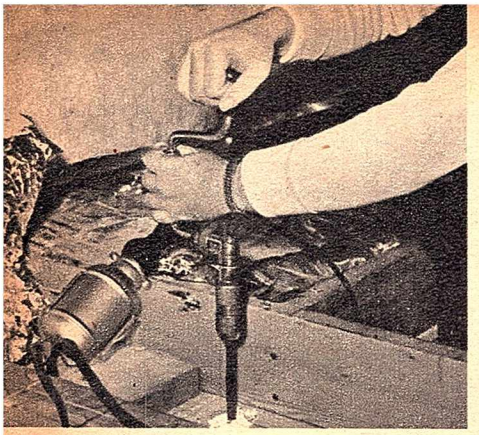
Ventilating fans are rated in terms of their capacity for moving masses of air. How much air they move is measured in cubic feet per minute (cfm). The fan's physical size is not necessarily a measure of its capacity although it is true that the larger the fan the greater is its capacity.

Because ventilation depends upon continued exchanges of stale for fresh air, your selection should be based on how many air changes you require over a given period of time for adequate ventilation. Practice and experience show that for homes in the South where entire household ventilation is desired, there should be a complete air change every minute. For Northern home a change every minute and a half is generally satisfactory. For spot ventilation

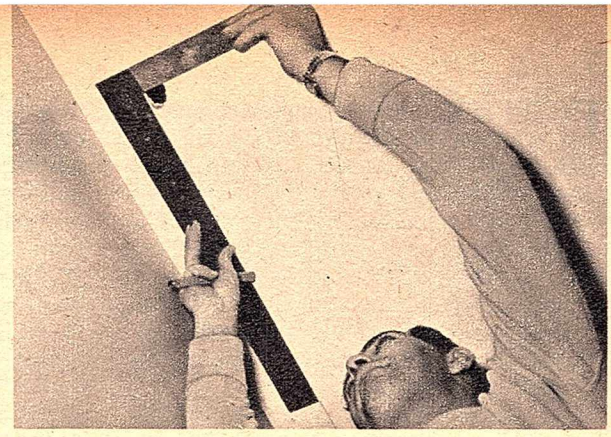
Drawings and installation photographs courtesy of Lau Blower Co.



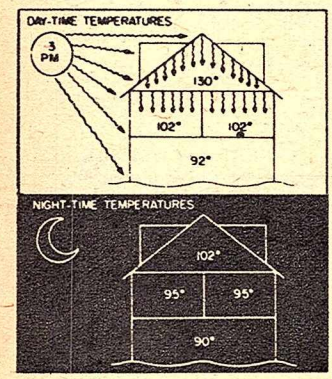
window. (4) Through attic wall. (5) In a basement. (6) In attached garage. (7) In a roof penthouse. (8) Attic suction box. (9) Vertical discharge. (10) Blocked siding.

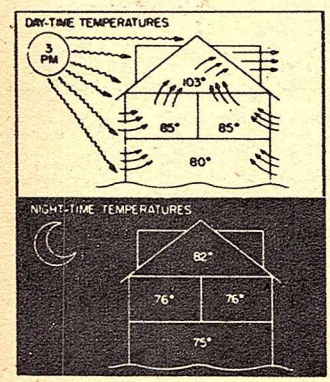


First step in installing attic fan is to locate carefully; then drill pilot hole.



Using pilot hole as base point, outline of shutter is marked off with a square.



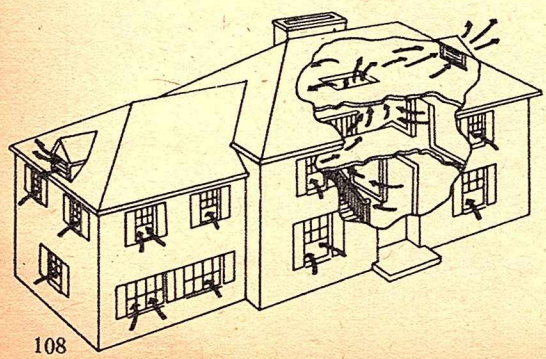


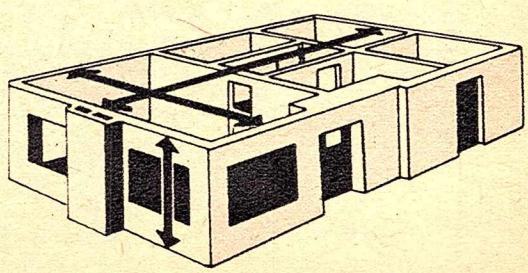
in kitchens, a complete change every two or three minutes is adequate and in bathrooms every two to five minutes will do.

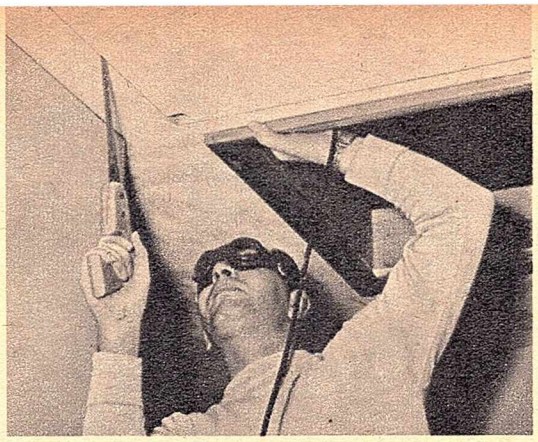
To select a properly rated fan you must determine the total cubic volume of the space you want to ventilate and then pick a fan which is certified as having a rating high enough to deliver the required cfm at normal static pressure. A six-room house in Michigan, for instance, will have about 10,000 cubic feet and will require a fan delivering 7,500 cfm for the recommended air change rate every minute and a half. In a kitchen of 900 cubic feet you will need a fan rated at a minimum of 300 cfm and so on. Don't let the matter of static pressure worry you, unless you plan on using very fine mesh window screens, specially designed exhaust louvers and grills, or have problems with shifting winds. Fan capacities are stated in terms of normally encountered pressure.

As is regrettably the case with most electrical appliances, there is more than one rating method followed by manufacturers of fans. You should check to see that the fan you select is rated according to the test standard of the National Association

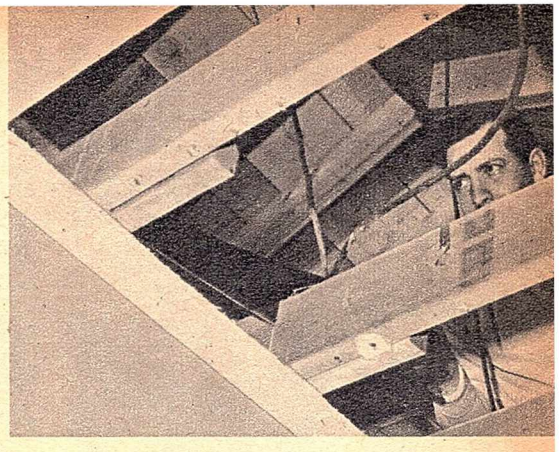
Drawings show temperatures in an unvented and vented house; air flow pattern; how to figure cubic content.







To cut plaster, first score with chisel then saw with medium tooth keyhole saw.

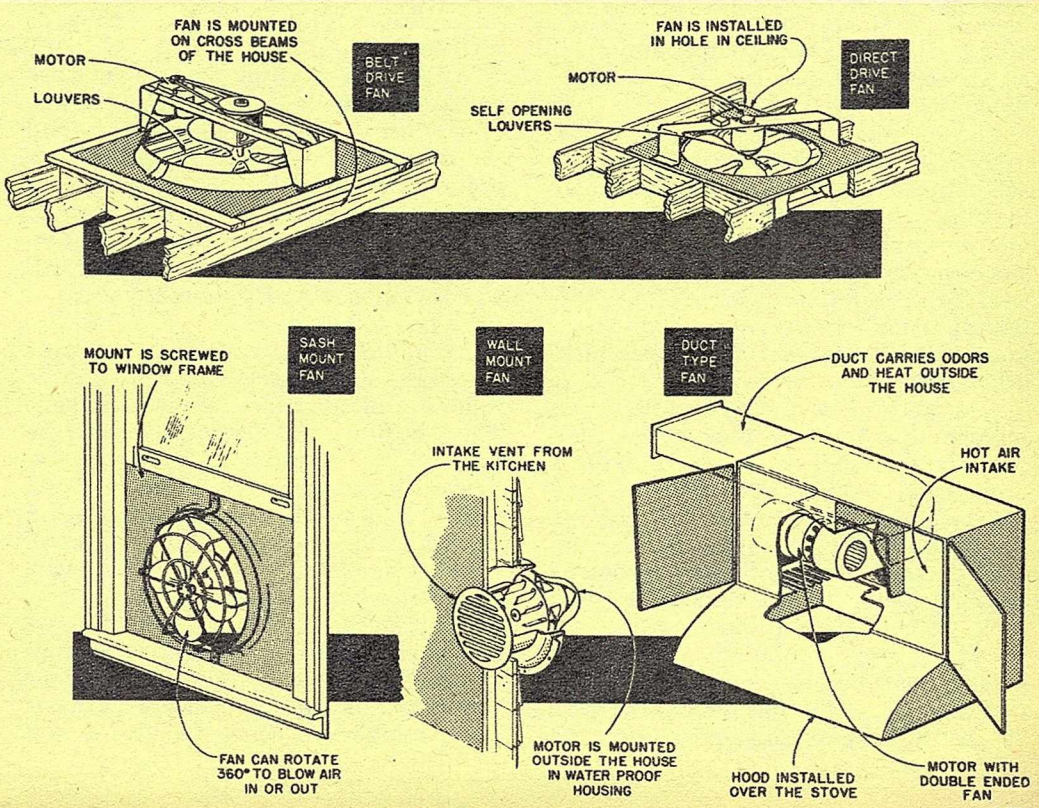


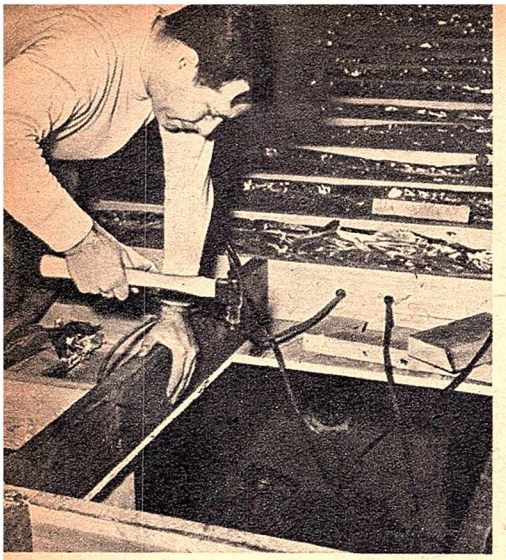
With ceiling opening finished, unwanted sections of joists are cut and removed.

of Fan Manufacturers and the American Society of Heating and Ventilating Engineers. The code of the National Electrical Manufacturers' Association (NEMA) which is used by some makers of ventilating fans is intended for circulating, not ventilating types and a unit rated at a given number of cfm will be over-rated by about 25%.

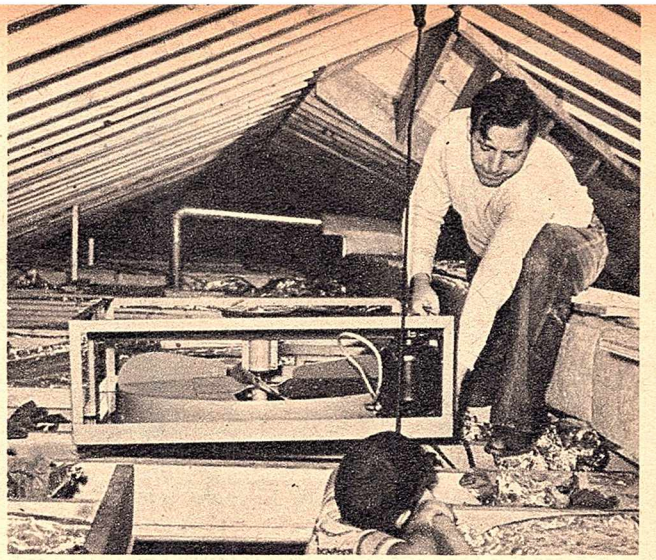
Besides having a properly rated capacity, a good ventilating fan should operate as quietly as possible. Don't, however, expect complete silence, as the rush of air through window screens and exhaust louvers in itself causes a certain amount of noise. The slower the fan the quieter it will operate, other things being equal. However, the slower the speed the lower the capacity. In buying a fan look for blades that are dur-

Drawings show five fan types: two attic blowers; one window fan and two kitchen vents.


FAN IS MOUNTED ON CROSS BEAMS OF THE HOUSE
MOTOR
LOUVERS
BELT DRIVE FAN
FAN IS INSTALLED IN HOLE IN CEILING
MOTOR
SELF OPENING LOUVERS
DIRECT DRIVE FAN
MOUNT IS SCREWED TO WINDOW FRAME
SASH MOUNT FAN
FAN CAN ROTATE 360° TO BLOW AIR IN OR OUT
WALL MOUNT FAN
INTAKE VENT FROM THE KITCHEN
MOTOR IS MOUNTED OUTSIDE THE HOUSE IN WATER PROOF HOUSING
DUCT TYPE FAN
DUCT CARRIES ODORS AND HEAT OUTSIDE THE HOUSE
HOT AIR INTAKE
HOOD INSTALLED OVER THE STOVE
MOTOR WITH DOUBLE ENDED FAN



In ceiling installation, joists are cut to size: header framework supports fan.



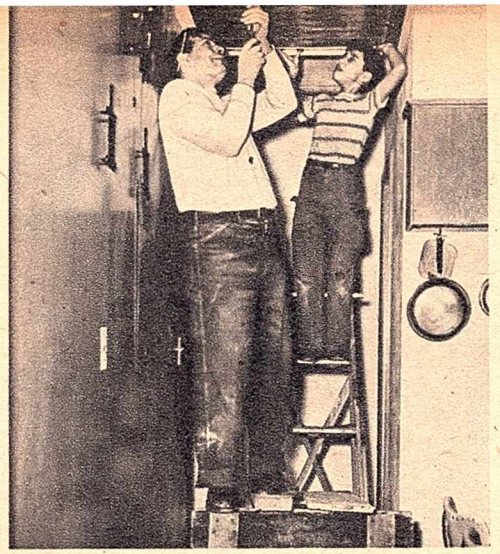
Above: Fan in place on shock absorbing pads. Its own weight holds it in place.

able and well-balanced. Out of balance blades will cause noise and may injure the motor and bearings. It should be constructed so that you can have easy access to the blades for cleaning and to lubrication points. There should be adequate guards on window fans to keep junior's fingers out of the rotating blades. It should be certified to have high quality electrical components such as wires, plugs and terminal connections.

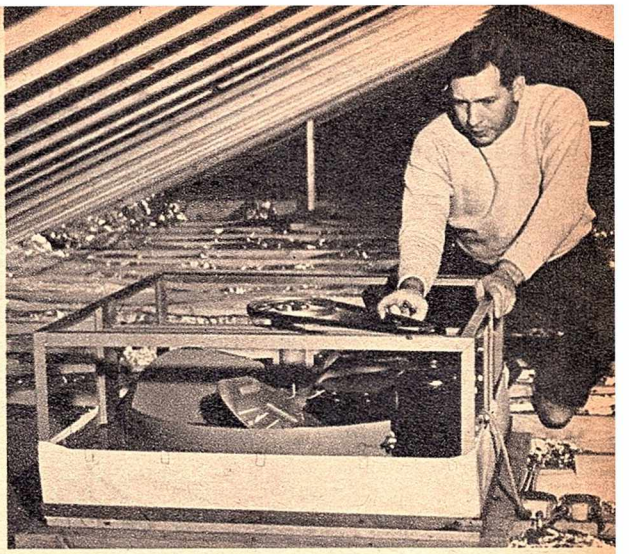
You may find that it is easier to buy a good window fan than a kitchen or attic fan because you can ask the dealer for a home demonstration. (This is obviously impossible with the other types since they require a hole in a ceiling or wall for installation.) Most of the better appliance dealers will be glad to help you in this matter but don't hesitate to ask. After all it's your money! It is mainly because of their easy mounting feature that window fans enjoy such popularity. Since all you have to do is prop them up in an open window they can be moved from room to room as the situation or your wife demands. The dual purpose design of many models is another factor in the success of this type. Some are equipped with electrically reversible motors; by switching polarity the direction of blade rotation is changed and the fan pulls in outside air instead of expelling room air. The same thing, of course, can be accomplished by simply turning the fan around in its mount, as is possible with some models without electrical switching features. Fan and mount can be turned in the case of less expensive jobs. Again, many newer models can be taken out of the window and used on the floor, on a desk, or hung from a ceiling or wall bracket.

While such versatile window fans are generally capable of ventilating up to two or three rooms, a more powerful fan is needed where four rooms or more are to be ventilated. Sufficient capacity is provided by an attic type fan mounted in an unfinished or finished attic space, in a garage wall or even in the basement as convenience and the architecture of your home may dictate.

Although a number of alternatives are possible, the same general layout is followed in all attic fan installations. There is, first of all, the air inlet into the house. This is provided by open windows or if you want to go to the expense, special inlets with air filters mounted in the walls. Next there is the fan itself which is mounted in some out of the way place where it isn't seen. The fan will suck in fresh air through the windows and expel it through exhaust openings in attic end walls, garage walls, under the eaves, or through dormer or basement windows. Since the fan is not



Shutter is secured in place over ceiling opening with wood screws at each corner.



To complete job, fan is wired to terminal box with BX; canvas strip joins fan to frame.

mounted in the house proper some connecting passage for the air must be provided from room to fan chamber. This is usually an opening cut through a wall or ceiling as the case may be. Installation is a do-it-yourself type project requiring only a few tools and a minimum of know-how and time.

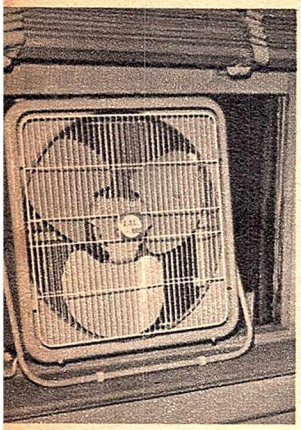
Since windows are the primary air inlet all you have to do is provide a connecting inlet to the fan room, furnish exhaust openings of adequate size and mount the fan in place. The sizes of the various openings are important for proper operation and it's a good idea to carefully check with the manufacturer's instructions.

Unless you want to get involved with a lot of ductwork, see to it that the connecting passage opening is as close to the fan chamber as possible. In general the opening should be in a central location so that air will be drawn with equal speed from all parts of the house.

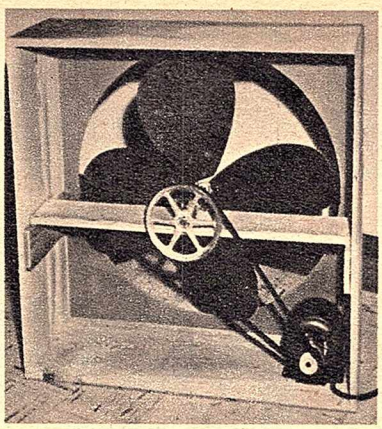
Exhaust openings can be in a number of places. As a matter of fact it's better to have several since one or two will always be in the lee of the wind and the fan won't have to buck any back pressure. A number of prefabricated louvers are available. Some of them are automatically controlled by the pressure of the air stream. They open when the fan goes on and close when the fan is switched off. There are other types that are operated by small motors on independent circuits. Whatever the type and wherever you put it, in an end wall, dormer window, eave, basement window or porch ceiling, make sure that it is big enough.

Two basic types of fan mountings are possible. In one the fan discharges horizontally. This type can be mounted directly behind an exhaust louver in a wall or window. If you plan to put one of the horizontal discharge types in the attic, it is important that the space be sufficiently air-tight to prevent outside air from being drawn in by the fan. If

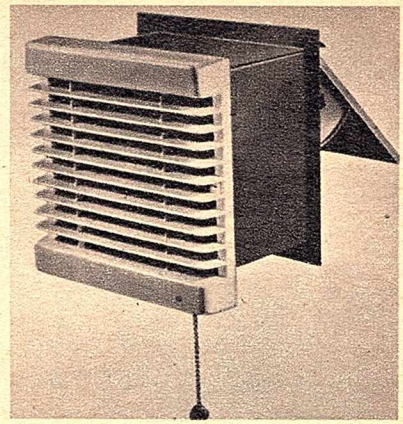
Before test run be sure some windows are open. Switch can be connected to timer.



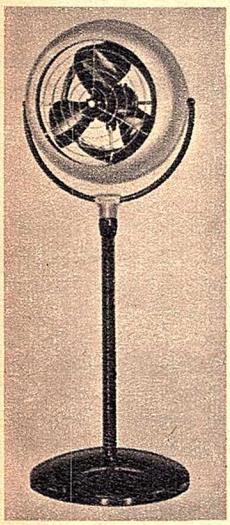
Lau 16 in. fan has 3 speeds; 75 to 95 watts; moves 2210 cfm. Has finger guards in front, rear.



This attic fan is available in knock-down form from the Fan Kit Co., Memphis 4, Tenn.



American Blower exhaust fan has pull chain on-off switch that opens outside shutter.



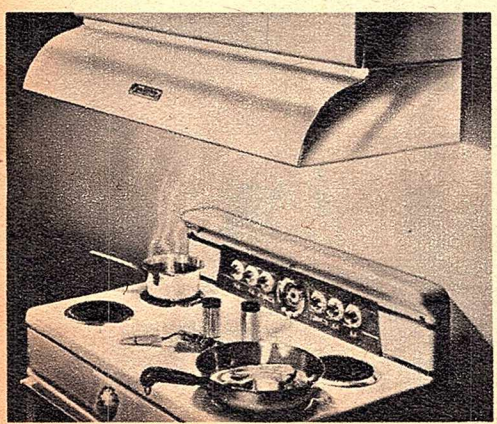
Pedestal style Vornado 60P lists for $130; fan shroud tilts.

this happens, the capacity of the unit will be reduced in respect to the air in the house proper. In this event an easy-to-build suction box must be constructed. The box couples the fan to the ceiling opening and there is no capacity loss. Instructions for making suction boxes can be obtained from manufacturers of attic type fans.

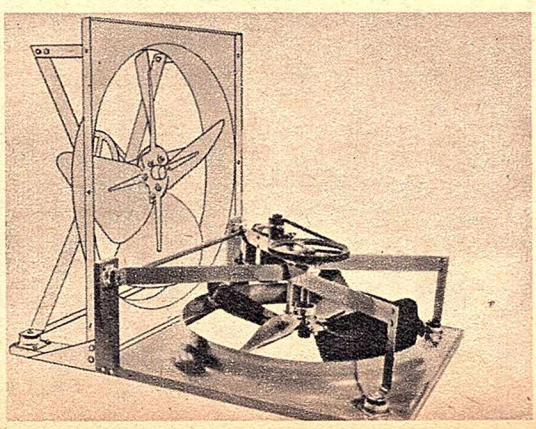
The second type of installation uses a vertical discharge fan which is mounted directly over the connecting passage. Air is blown into the attic space and vented through louvers as before. Neither type is secured directly to attic framing since a rigid mount will transmit vibrations from the fan to the wall and ceiling which in turn act as sounding boards. Attic fans should be shock mounted on springs or rubber cushions to damp out motor vibrations.

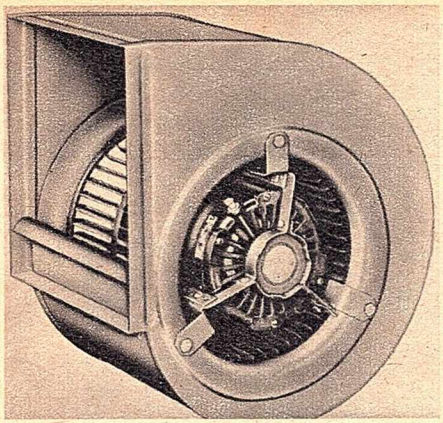
If you have decided on using automatic louvers, check your local building codes to see if they require that a fusable

NuTone 36-in. hood over range connects to fan; costs $38.50; 42-in. size $59.50.

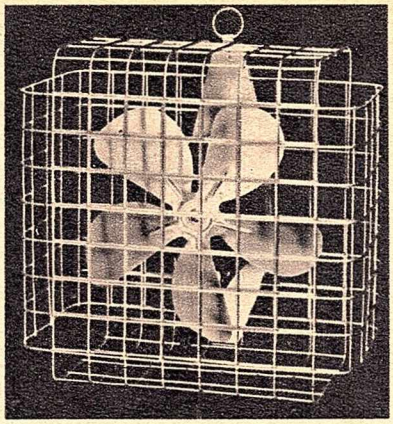


McLean fan is designed for horizontal or vertical use; sizes to 42-in. available.

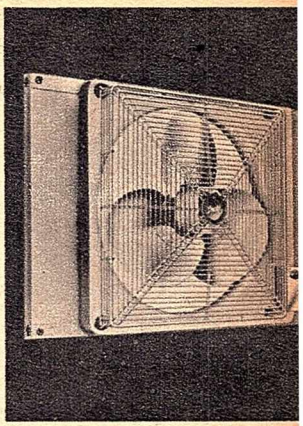




Typical squirrel cage blower. Motor mounts inside the cage. Product of Utility Fan Corp.



McLarty Handifan capacity is 450 cfm. Measures 9½-in. square; is priced at $15.95.



Diehl 20-in. window unit has electrically reversible, two speed motor. Moves 2800 cfm.

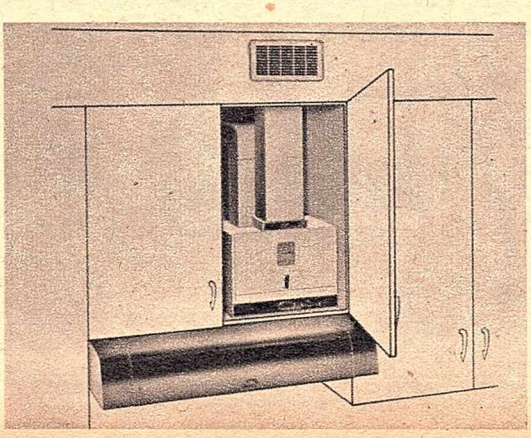
link be placed in the louvers' control mechanism. These links melt at about 135° in the event of fire, automatically closing the louvers and stopping any fire-spreading drafts.

Once the grill work is in place, and the fan is mounted and connected to a conveniently located switch with BX cable, you're ready to turn it on. Be sure to open some windows. Adequate inlets are important in basement installations as the suction may create a reverse draft and extinguish the hot water heater or pilot lights.

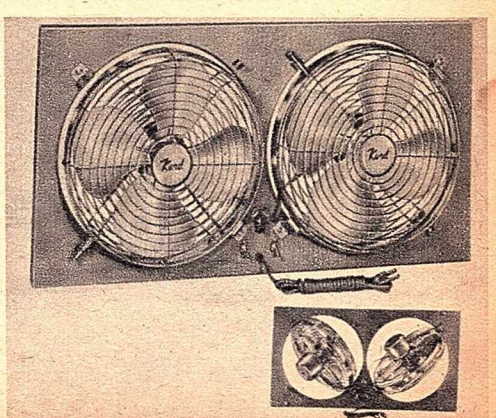
While an attic fan really does its stuff during warmer weather, when you can have lots of windows open, it can also be used during colder seasons for limited venting. If you have used automatic louvers, the fan can be switched on for brief periods to clear the air. Or, if you desire, it can be hooked up to an interval timer so that the fan will automatically go on for one or two minutes every quarter of an hour or so, giving some relief from stuffy air. Proper timing will hold heat loss through the ceiling opening to a minimum.

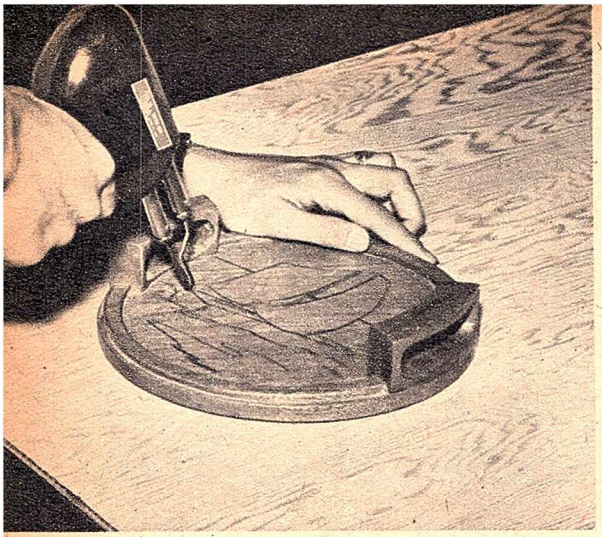
If you're not concerned with ventilating the whole house but do want spot venting and cooling of the kitchen, the bathroom or home workshop, try one of the kitchen type ventilating fans. These small units with capacities of 1,000 cfm and [*Continued on page* 160]

Trade Wind model 3501 kitchen fan mounts in cabinet; costs $107 without the hood.

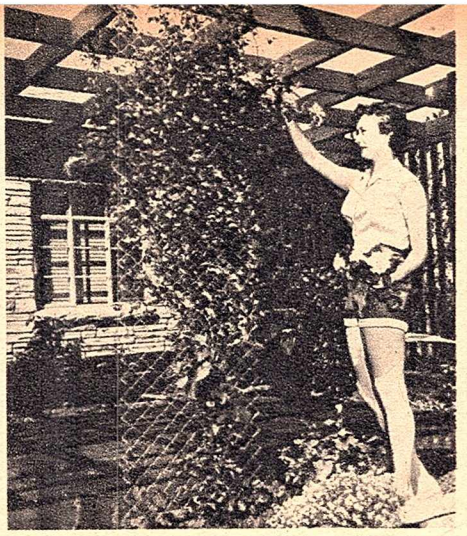


Kord dual window fan has two speeds with 2100 cfm top capacity. Price is $49.95.

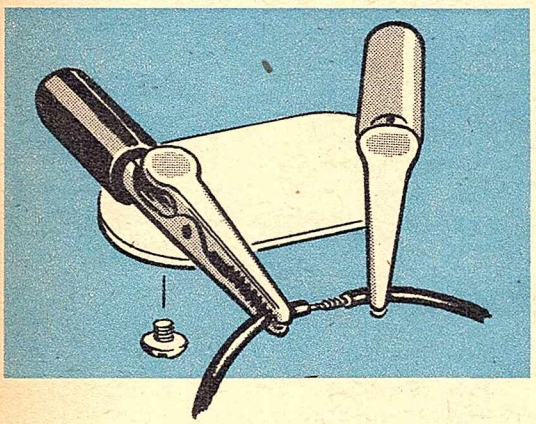




You can use a length of copper wire to match the tip of a transformer-type soldering gun for burning various designs into wood.



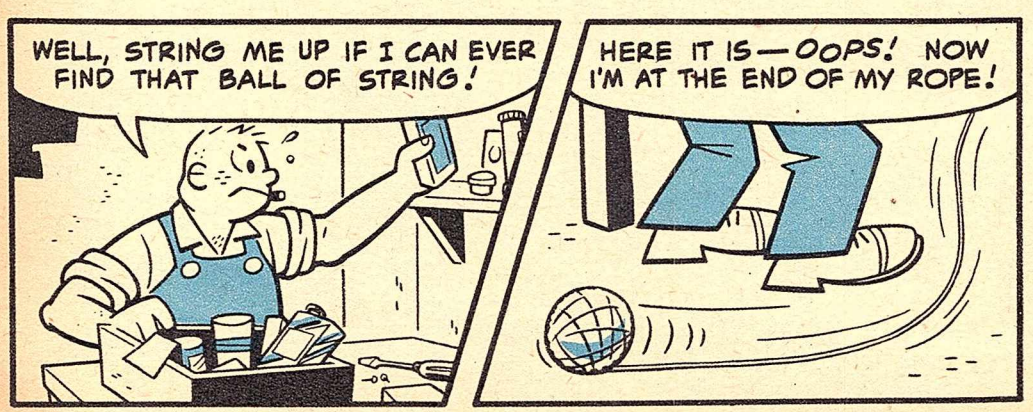
Aluminum trellis is rust proof, needs no maintenance; 2 ft. wide x 10 or 25 ft. long. Nichols Aluminum Co., Davenport, Iowa.

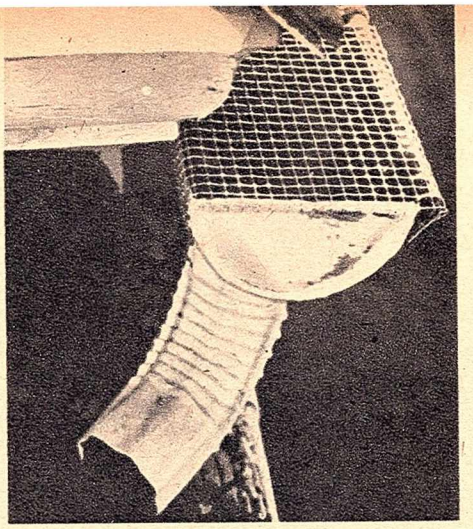


HOME And SHOP TIPS

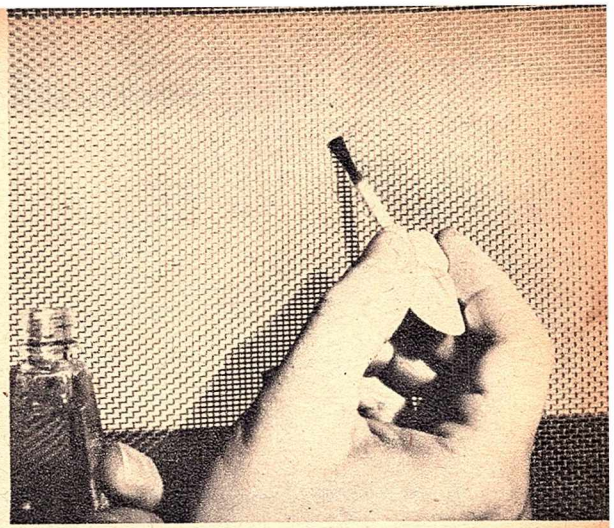
Fasten two alligator clips to metal plate, as shown at left, to make a handy tool for holding two wires together when soldering.

FREDDIE FUMBLES



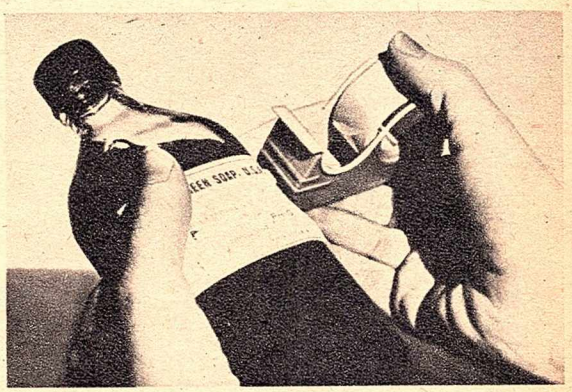


Protect eave troughs against leaves and other debris with wire screening. Bend over trough and attach with rust-resisting wire.

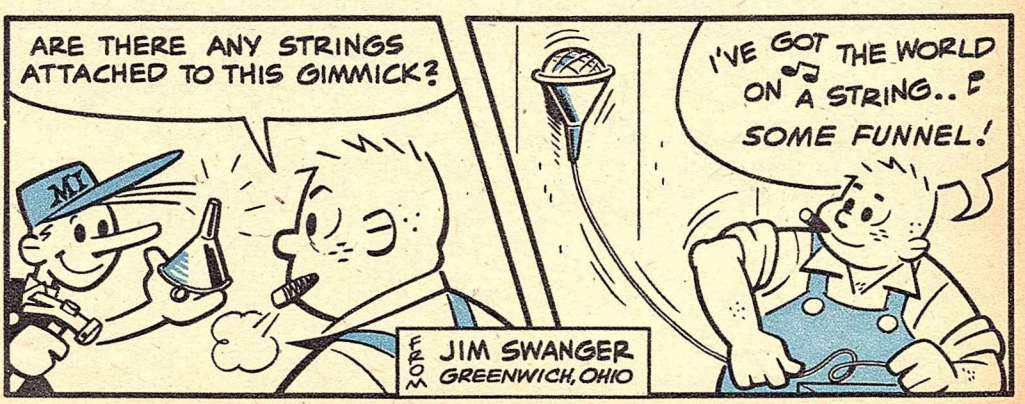


You can make repairs to your screens in seconds by dabbing the hole with nail polish. Patch is effective and practically invisible.

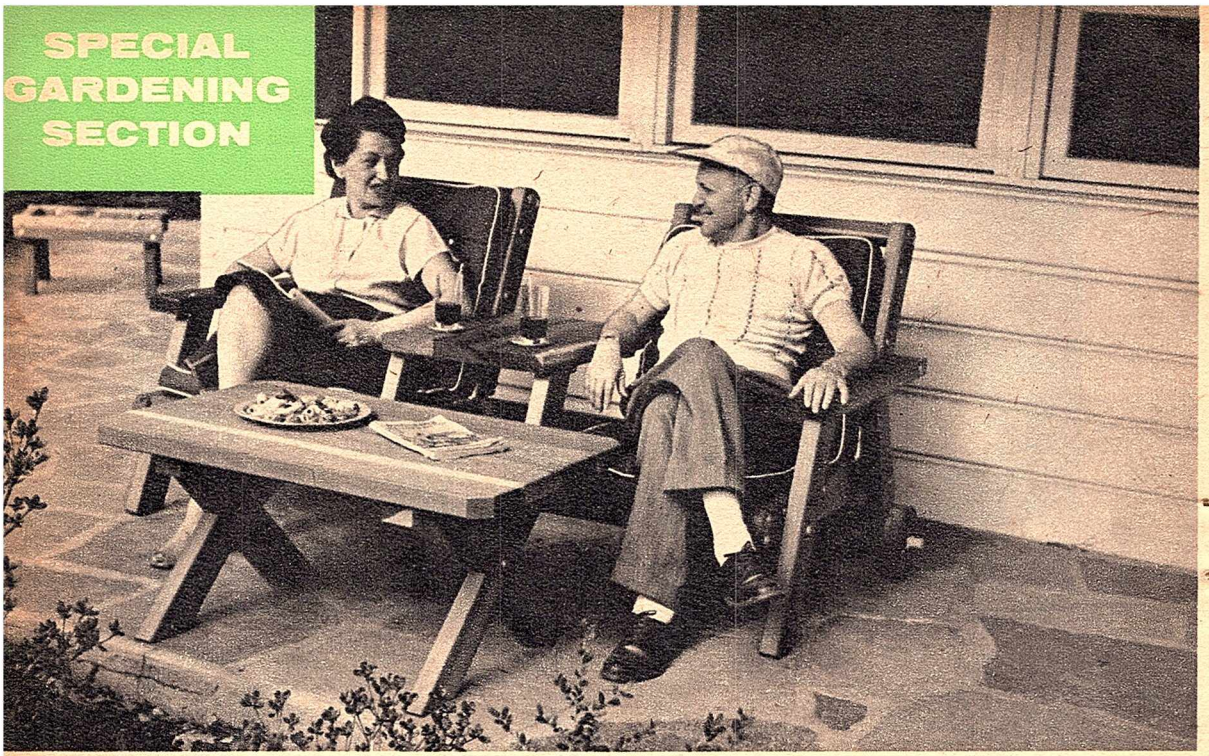
To protect labels on medicine bottles when pouring the liquid, cover the label with clear cellophane tape.



Send Freddie Fumbles your idea of a good short-cut, time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However, all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a post card. Address to: Freddie Fumbles, *Mechanix Illustrated* Magazine, 67 W. 44th St., New York 36, N. Y.



SPECIAL GARDENING SECTION



Lawn And Garden Furniture

Outdoor living is fun if you have the suitable furniture. Here are several plans for constructing your own, at a considerable saving.

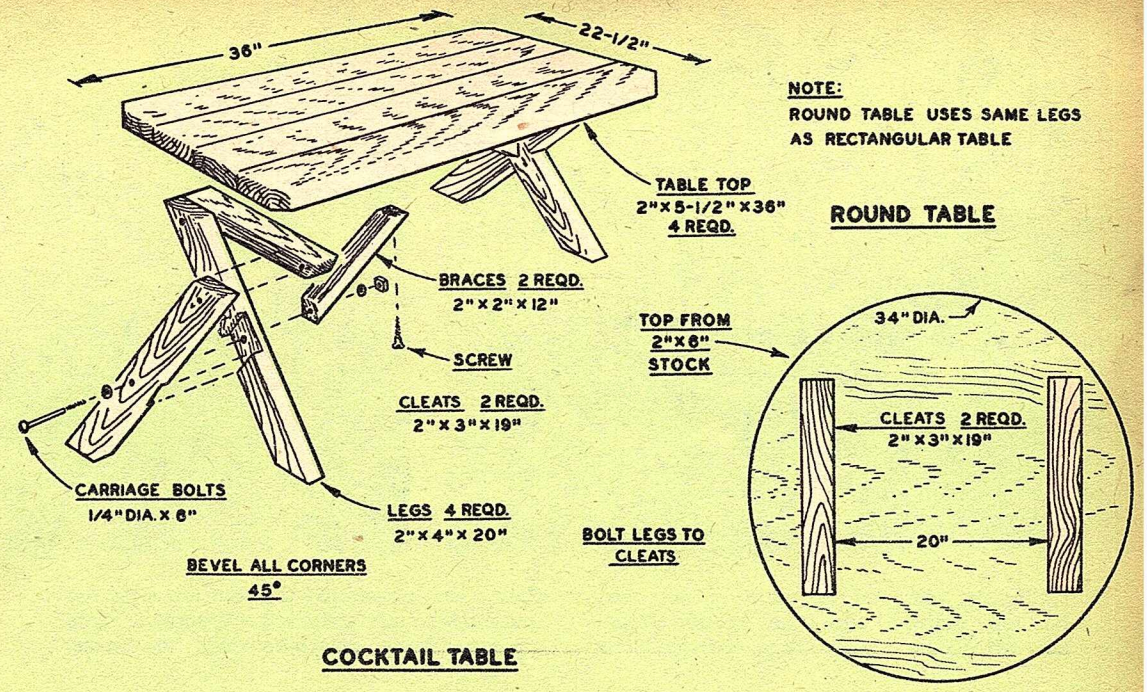
By Bill Hinden

WHEN those hot, stuffy summer days arrive, when having lunch or dinner indoors becomes downright unbearable, then it's too late to wish for some nice, comfortable outdoor furniture. Wishing won't make it so; now is the time to plan and build for those hot summer months.

The drawings on the following pages show many attractive units that can either be built separately or in combination with each other. They were designed for comfort, relaxation and durability, and their simple construction makes them an ideal project for the home craftsman. All pieces are built from California redwood, a soft, decay-resistant wood that can be left outdoors in all weather, rain, shine, hail or snow.

Cocktail Table

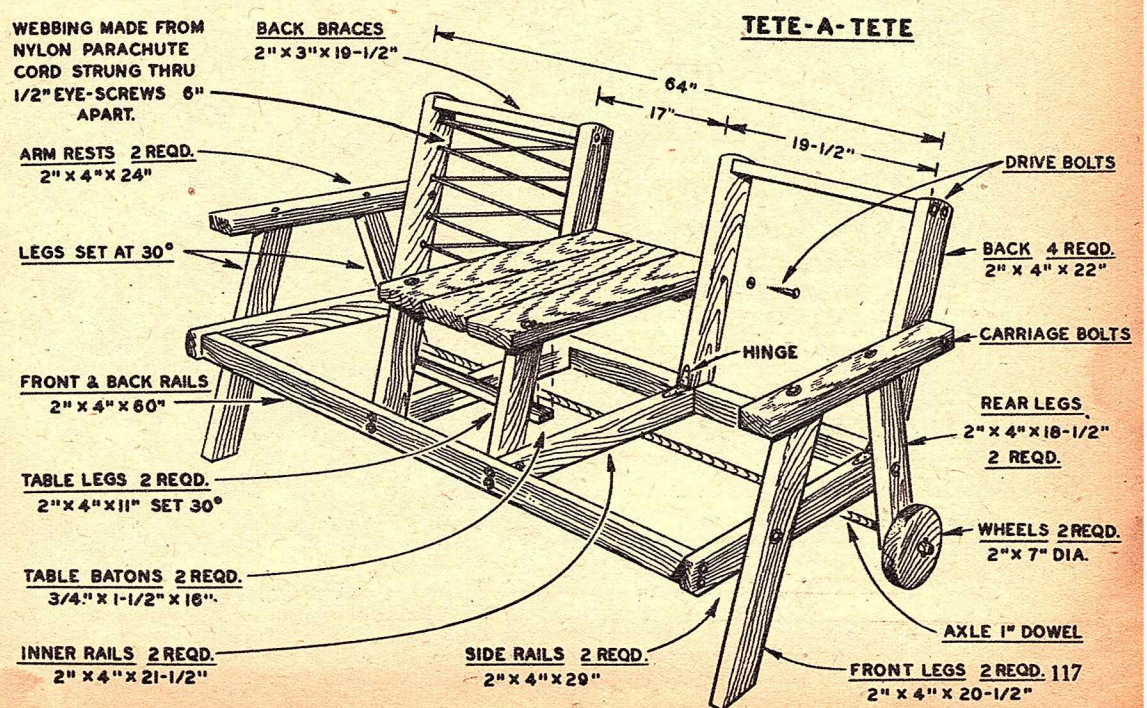
According to your choice, either a round or rectangular cocktail table may be built from the plans. The circular table top, 36 inches in diameter, consists of six 2-inch boards. The two center boards are 6x34-in., flanked on each side by a 6x32-in. board; the two outside planks are 5x25-in. They are held together on the underside by two 2x3x19-in. cleats. Screw the cleats temporarily to the top and draw a 24-in. diameter circle on the table. Remove the cleats and cut the individual top pieces on a band saw and sand the edges with the help of a disc sander.

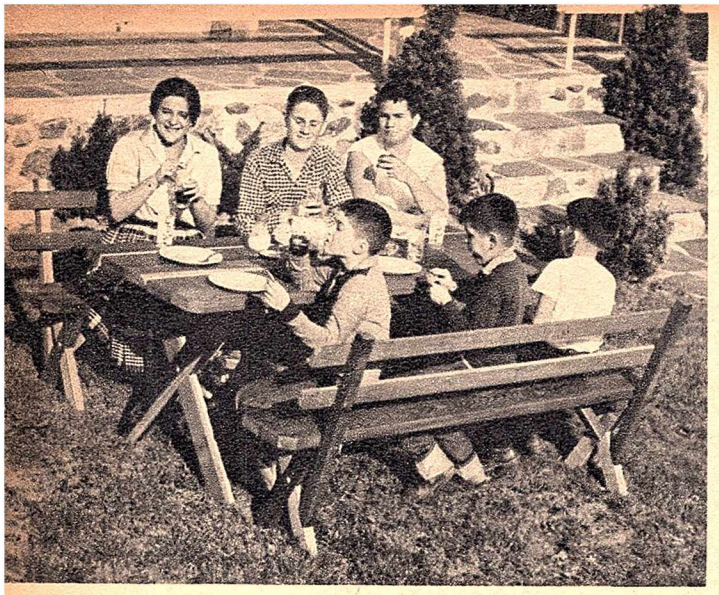


Re-assemble the boards and finish the edge with the sander until it is as round and smooth as possible.

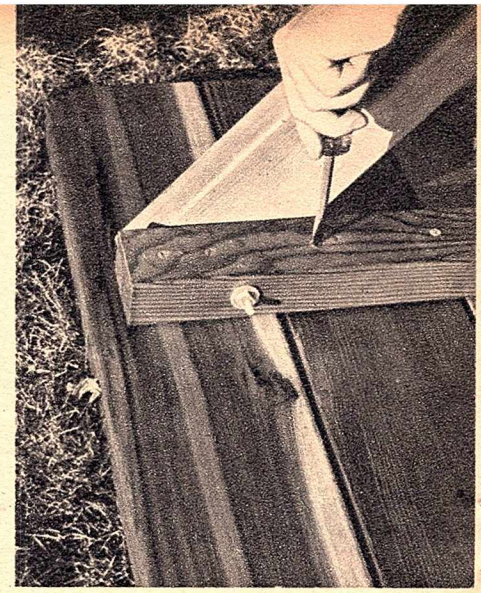
The four legs, as shown on the drawing, have a 45° bevel and attach to the cleats with a six-inch long carriage bolt through the center of each pair of legs. These bolts, as all other hardware, should be cadmium plated to resist rust. The rectangular cocktail table, except for the top, follows the same construction procedure as the round table.

After all surfaces are thoroughly sanded and sealed with a special filler





California redwood needs no paint, may be left natural with the proper finish. Set will accommodate six to eight persons.

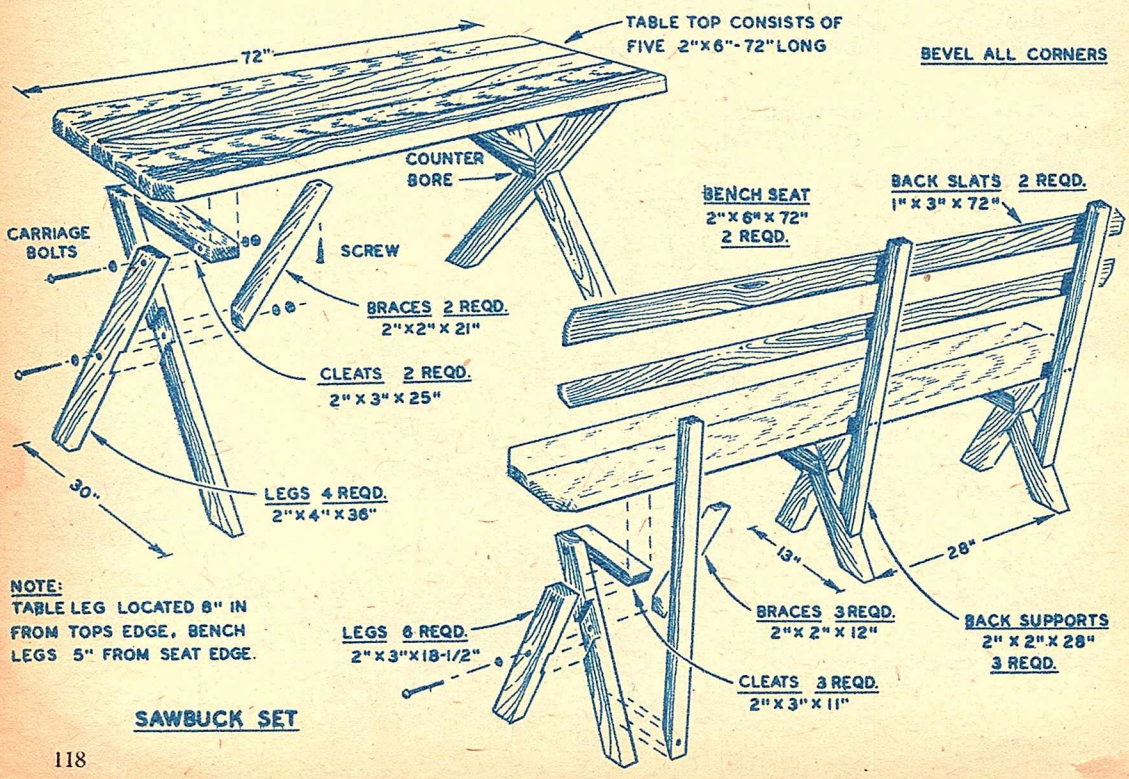


Cleats are assembled to table top from the underside, countersinking all screws. Note carriage bolts attaching legs to cleats.

called Cereseal, the desired finish, such as shellac or lacquer may be applied.

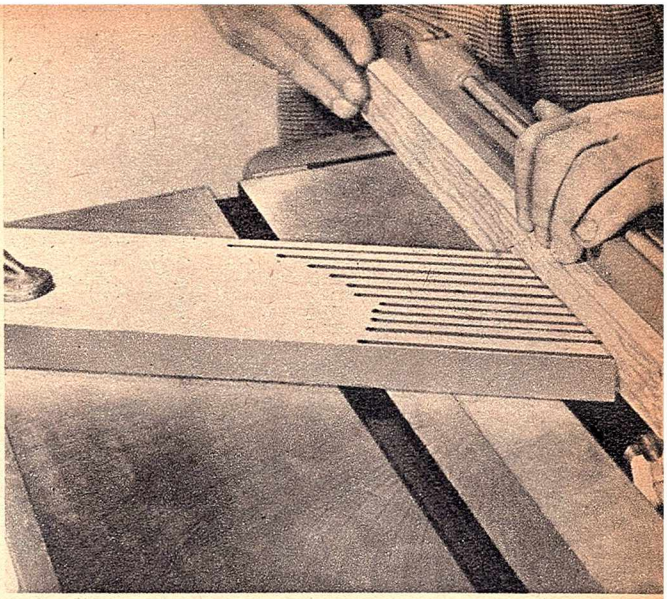
Tete-A-Tete

This unit is one of the more de luxe developments of redwood outdoor furniture. Actually it is a combination of two club chairs with a convenient center table fixed between them. The overall length of this piece is 72 inches, 64 inches



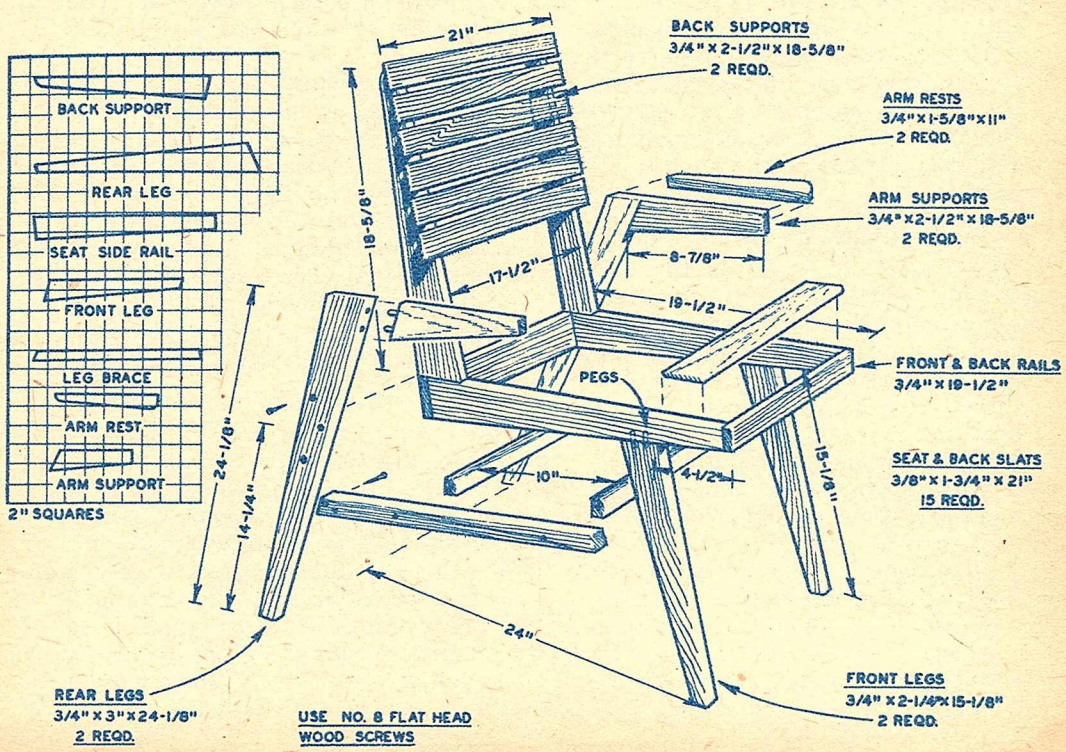
SAWBUCK SET

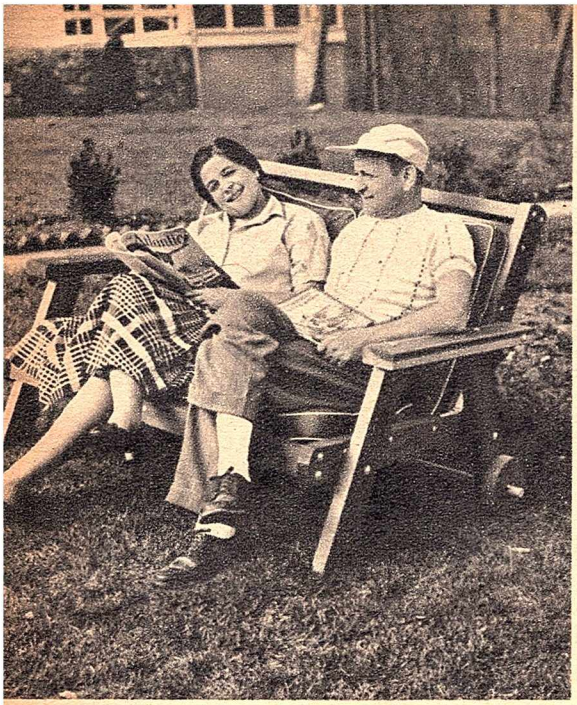
Lawn chair is shown here painted, but may be left natural. The modern design of the arm rests make this an attractive unit.



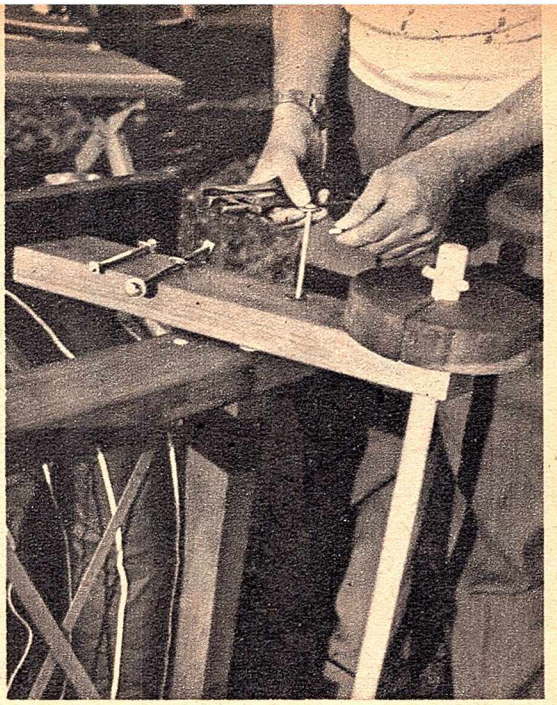
Round the upper edges of the seat and back slats with a moulding head, mounted on a circular saw, or sand with fine sandpaper.

between the arms, and 32 inches wide. Construction is simple, all individual pieces attaching with carriage bolts. One novel feature is the use of nylon parachute cord, slung through eyelets, supporting the seat cushions. The wheels are seven inches in diameter and should be turned from solid stock. Place a washer on each side of the wheel and run a wooden cotter pin through the one-





The usefulness of the love seat is increased by its mobility. The unit can be easily moved around on its two wheels.



Cadmium plated carriage bolts are inserted into the wood from the outside, so that the head will be visible, the nut hidden.

inch dowel, acting as an axle, to hold the wheels.

The cushions for this piece can be bought from most mail order houses; they should be cotton-filled and have at least a 10-ounce duck material covering. A plastic-coated material on the reverse side is suggested as a water repellant if the unit is left out on the lawn in all weather.

Sawbuck Set

A good-sized set, such as the one illustrated, comfortably seats from six to eight people. To assure a sturdy unit, all redwood lumber used, except for the backs of the benches, should be of two-inch stock. Each bench has two back slats, 1x3-in., and two 2x2 back supports, 30-in. long. The angle cut at the bottom of the back supports will depend on the angle of the legs and should be cut at the time of assembly.

The top back slat is fastened two inches down from the top of the back supports; the second back slat should be at least three inches below the top slat.

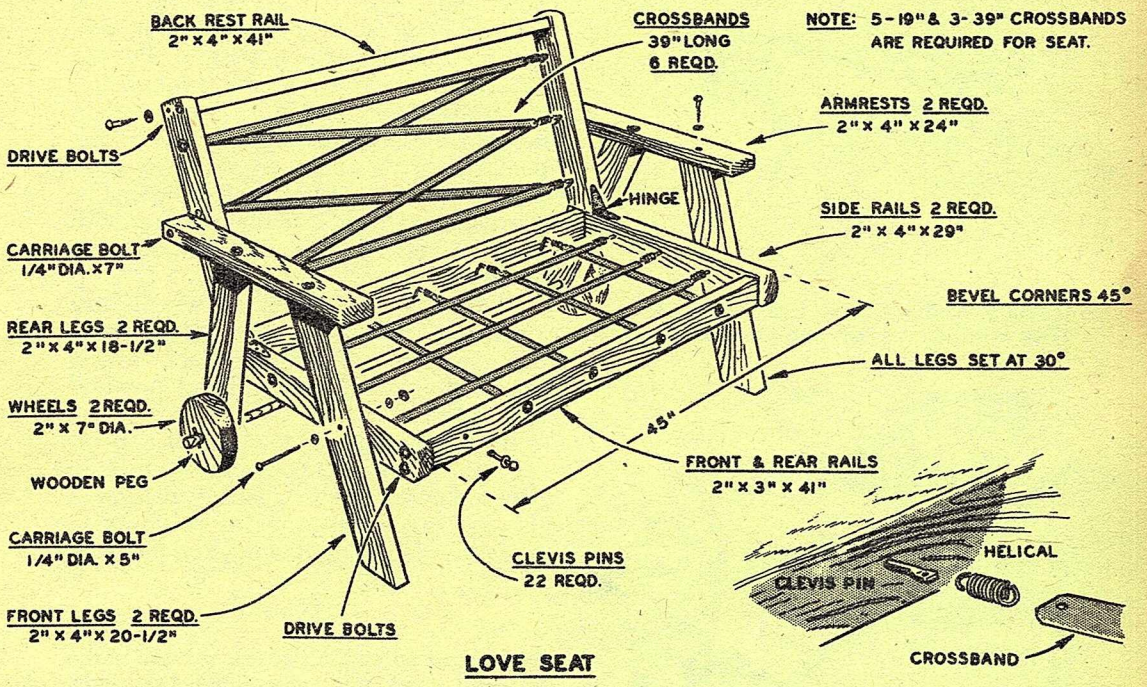
Get the proper angle of the crossed legs by drilling a ¼-in. hole through the top of each leg into the cleat. Make a triangle of the legs and then drill a hole through both legs half-way down. The same procedure is followed for the table legs.

The table top consists of five 2x6x72-in. pieces, screwed into the cleats from the bottom. The corners of the table as well as the bench seat are beveled at a 45° angle. The bottom of the table and bench legs should also be slightly beveled to prevent splintering when moving the unit along a concrete surface.

Apply the same finishing coats as previously mentioned, allowing a few days for drying before using the set.

Lawn Chair

Start construction by cutting all pieces to size on a circular saw. Lay out the dowel holes in the front legs, arm supports and back supports. Match the dowel hole positions carefully for joining the side rails and rear legs. Set your drill press table to a vertical position and clamp a board to the table so that its edge serves as a guide to drilling at the proper angles, and clamp the chair pieces in position. Drill the dowel holes



LOVE SEAT

in the leg braces and glue dowels in place, using Weldwood or similar glue. Then, round the corners of the arm rests and back supports on a band saw or disc sander.

Lay out, drill and countersink all screw shank holes. Assemble the front legs, side rails and back supports with No. 8 flathead screws, as shown on the drawing. Reinforce all dowel joints with ½-inch brads through each dowel and finish assembling the piece.

Sand all surfaces thoroughly making sure that no rough edges remain. Finish in the usual manner. Additional coats of shellac or lacquer may be applied to the inside chair surfaces because of the greater wear of this piece.

Love Seat

This two-seater on wheels is not only very decorative but can also be easily moved around from place to place.

Construction follows the same procedure as the previously described units. One feature of the love seat is its spring arrangement, obtained by the use of steel crossbands attached to helical springs. These bands are supported by clevis pins, as shown. In assembling this unit, as well as all the others, insert all bolts from the outside, so that the head of the bolt will show, hiding the nut on the inside. Always use two washers, one under the bolt, one under the nut.

The cushions may again be purchased in mail order houses, with the same weather-proof specifications as the ones used on the tete-a-tete.

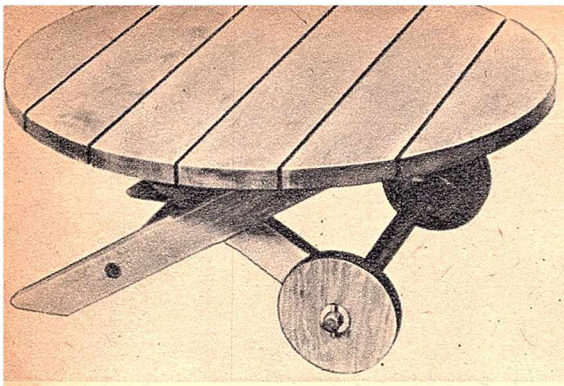
Circular Coffee Table

Construction of the top of this unit follows the same steps as the circular cocktail table, described earlier.

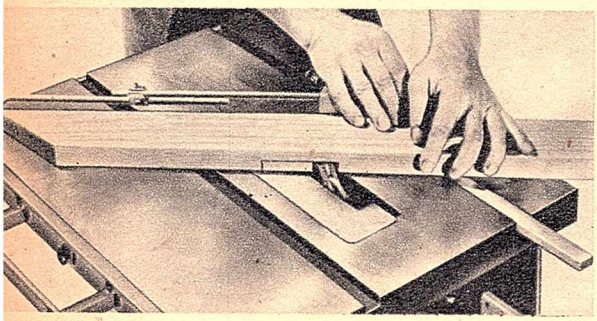
After the individual top pieces are cut to the circular pattern, assemble them to the cleats with waterproof glue and screws, spacing the slats at not more than ⅛th of an inch apart. Assemble the unit and finish in the previously recommended manner.

Lounge

All pieces are layed out and cut on a circular saw. Lay out the handles on the side rails and cut on a band saw



Circular coffee table has rustic design. Note ⅛-in. space between table top boards.

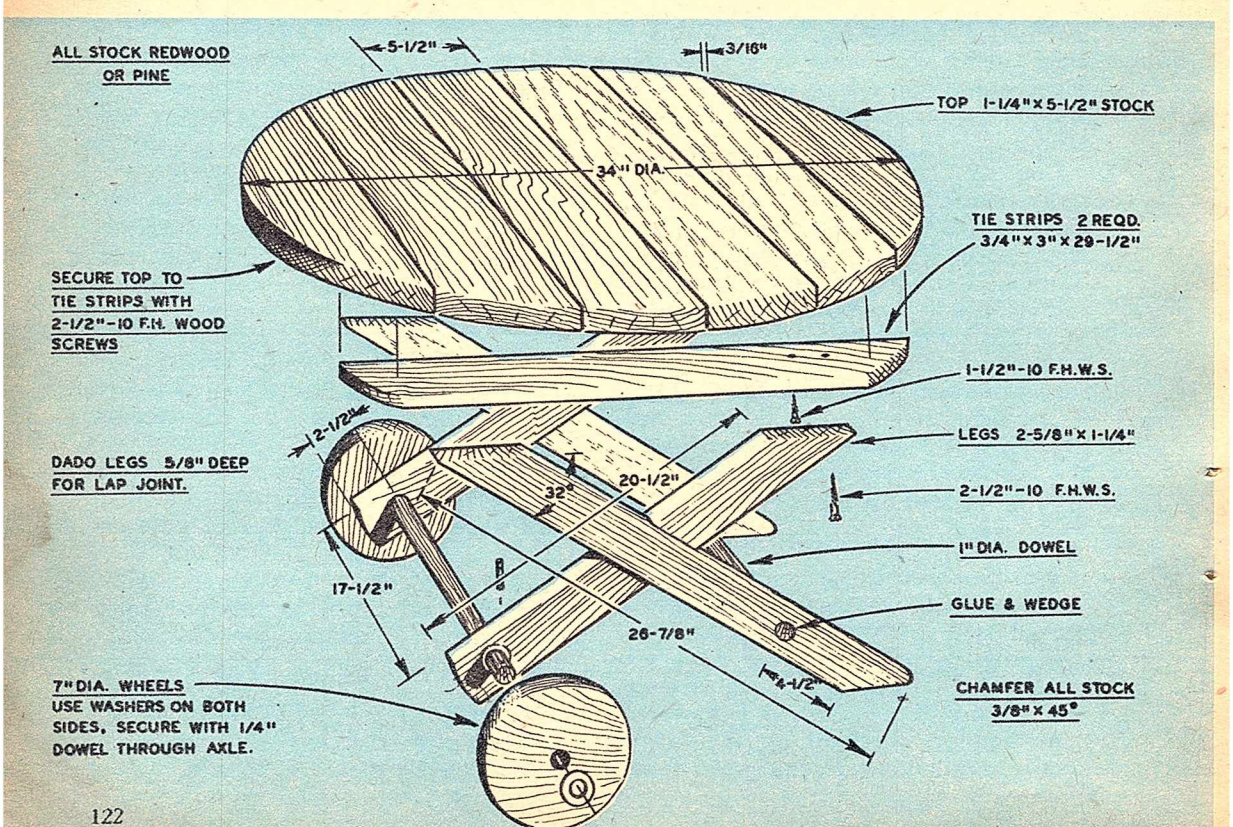


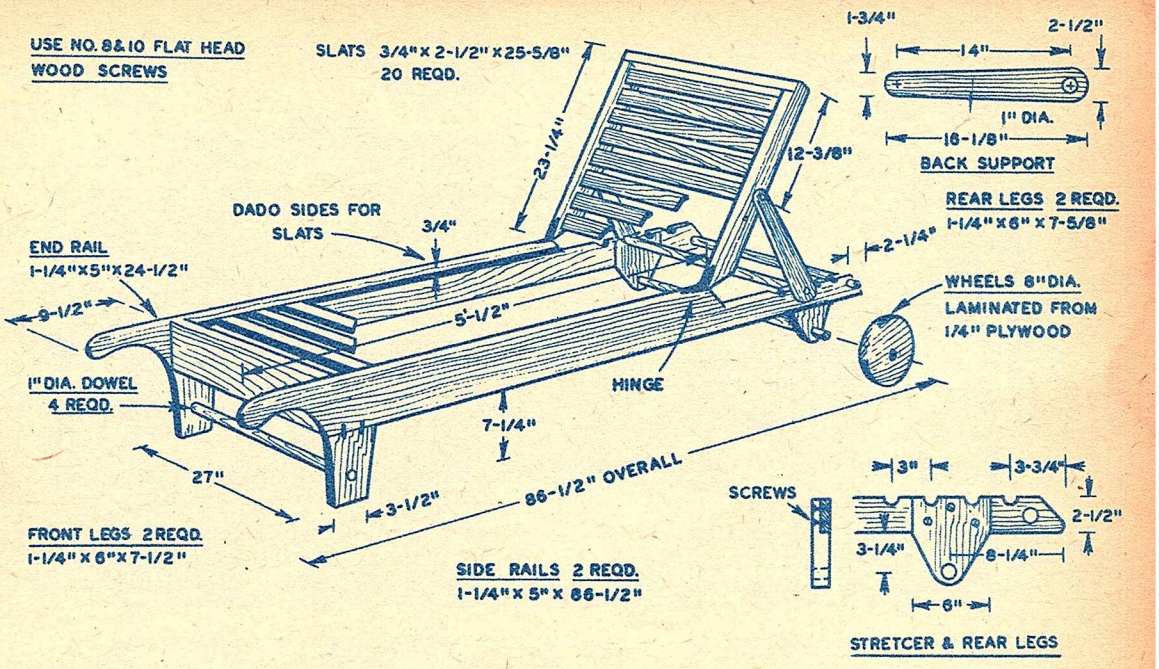
Dado head on circular saw is used to make the lap joint for joining the two legs.

Round off the hand grips with a file and sand paper. Lay out the rear end of the rails and cut the kerf on a circular saw, making sure that the bottom of the saw cut does not go beyond the layout lines. Next, the dado grooves are cut to accommodate the cushion support slats. Repeat the same steps on the two back pieces and hinge them to the side rails. The slats are fitted into the grooves, with a spacer between each slat, and glued in place.

The eight-inch diameter wheels are laminated from pieces of ¼-in. plywood, using waterproof glue between layers. When glue is dry, cut on band saw and sand edges.

Apply desired outdoor finish and install the 3x24x72-in. canvas or plastic covered cushion. Attach the cushion to the top rail with straps or webbing to prevent its slipping down when the back

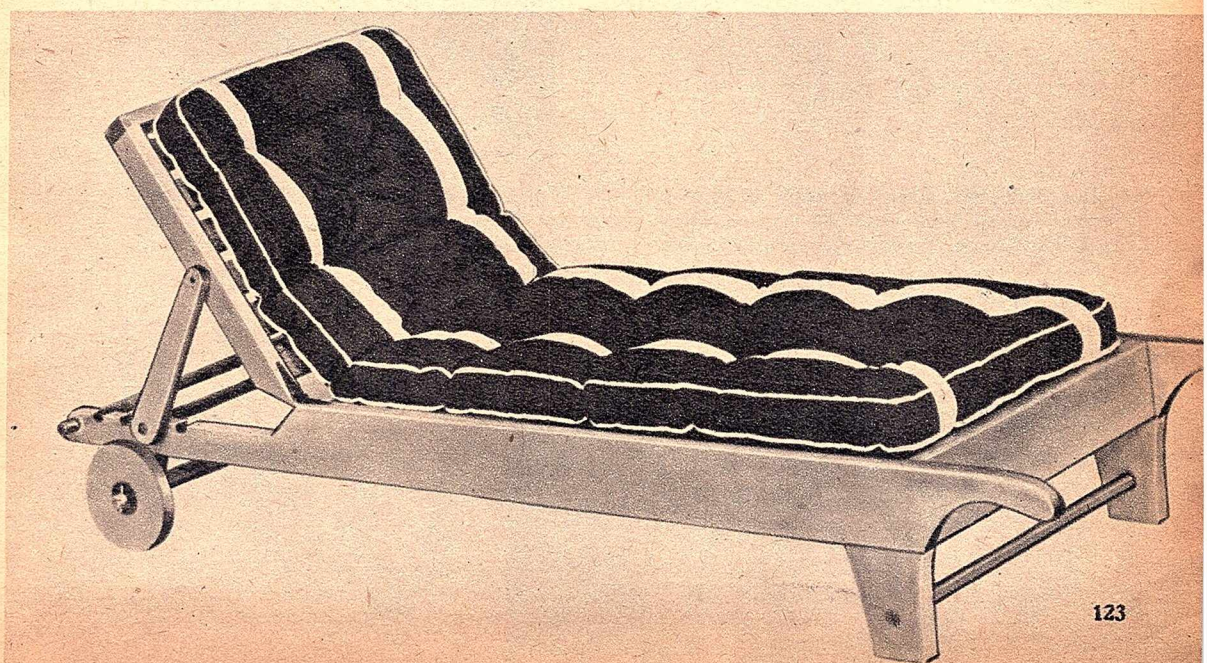


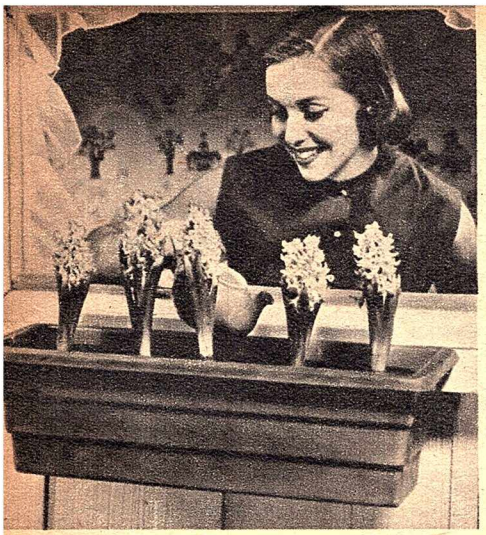


of the lounge is in an upright position.

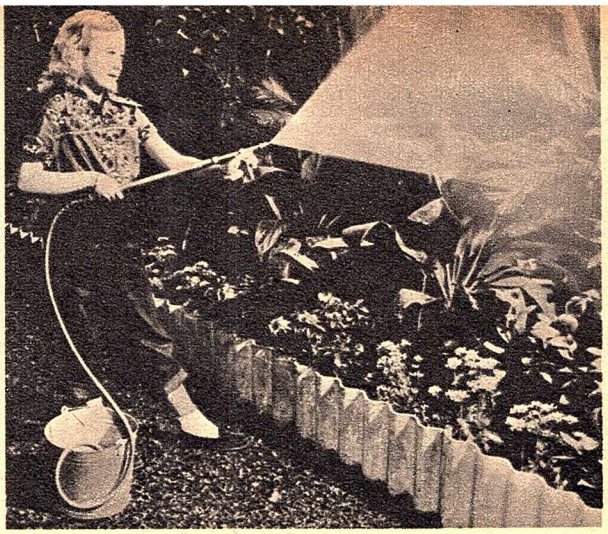
One last word on the finishing of outdoor furniture. Articles which are to be exposed to the weather must be finished with extra care if they are going to look well later on. One way to insure this is to treat the wood with a good grade of wood preservative before applying other finishes. It is especially important to treat the parts that will be in contact with the ground, such as the legs of all tables and benches, as well as all other parts not covered by cushions and therefore exposed to the elements. Care at this stage will pay off later on in the longer life of the unit. •

The adjustable back of the lounge makes this a useful unit for reading or sunbathing.





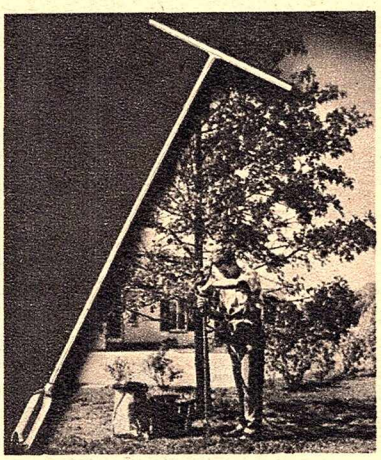
1. One-piece molded plastic window flower box is weather-proof, won't dent, crack or peel. Available in various gay colors.



2. World Slide Sprayer develops 150 lbs. of pressure, weighs 2½ lbs. Nozzle adjusts to either a fine mist or a 30-foot stream.

NEW GARDEN PRODUCTS

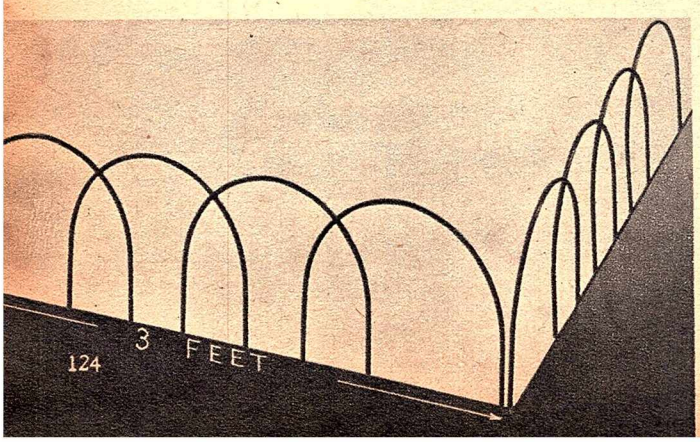
3. Tree-Feeding Auger designed to apply plant food to feeding roots of trees; bores a 2-inch diameter hole up to 36 inches deep.



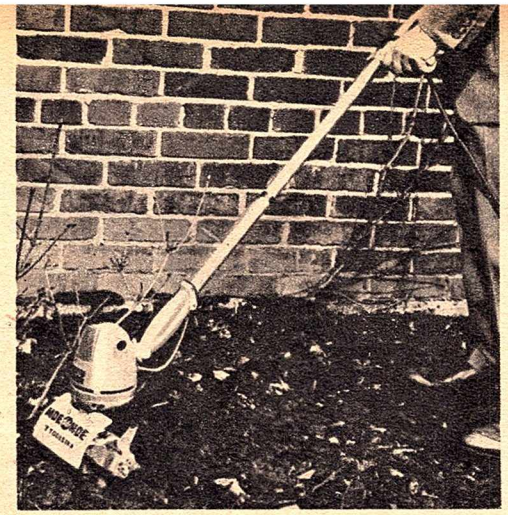
Manufacturers' Names and Addresses

1. U. S. Rubber Co., Rockefeller Center, New York 20, N. Y.; 2. All States Sales Co., 2623 Love Field Drive, Dallas 19, Tex.; 3. A. B. Chance Co., Centralia, Mo.; 4. Kelsey, 1687 McDonald Ave., Brooklyn 30, N. Y.; 5. Downs & Co., 816 University Pl., Evanston, Ill.; 6. Iron Fireman Mfg. Co., 2800 S.E. 9th Ave., Portland, Ore.; 7. Corrado, Inc., 26 N. Clark St., Chicago 2, Ill.; 8. Waldor Greenhouses, Salem, Mass.; 9. Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill.; 10. Garden Aids, Inc., Laurel Springs, N. J.; 11. General Scientific Equipment Co., 3011 Dixwell Ave., Hamden 14, Conn.

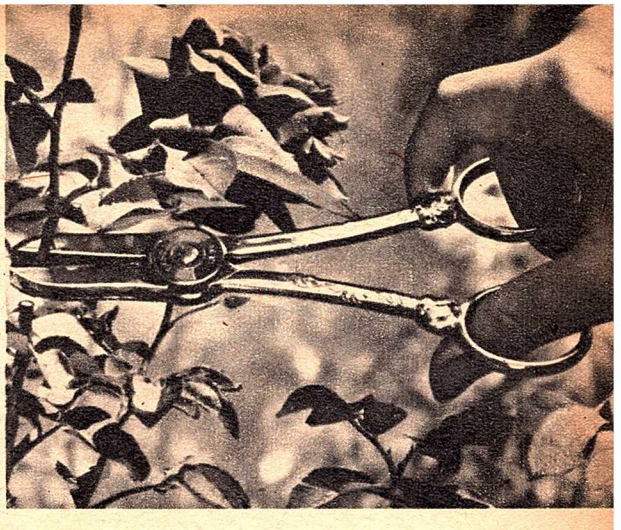
4. Prefabricated 3-foot sections of plastic covered steel fence are 14 inches high. Used for lawns, driveways, gardens, etc.



5. Weed puller for getting rid of Crabgrass, Plantain, Buckhorn, etc. Specially designed teeth slip into roots, remove weed.

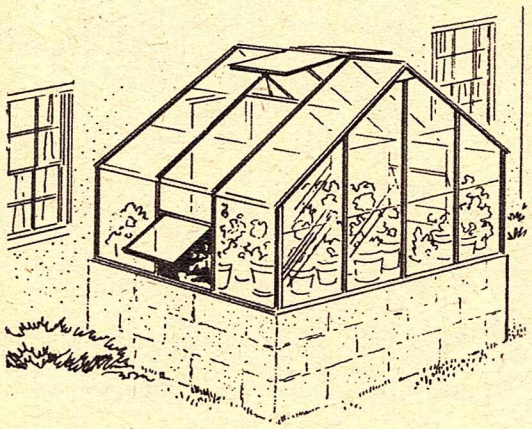


6. Moe Hoe, a combination tool for cultivating, drilling, trimming and clipping. Unit can also be used for floor polishing.



7. Flower holding shears grip and hold stems while cutting them. Prevent soiling and tearing of clothes; rustproof finish.

8. All-aluminum prefabricated greenhouse stands 8x6 feet; it can also be attached to the sides of any building if desired.

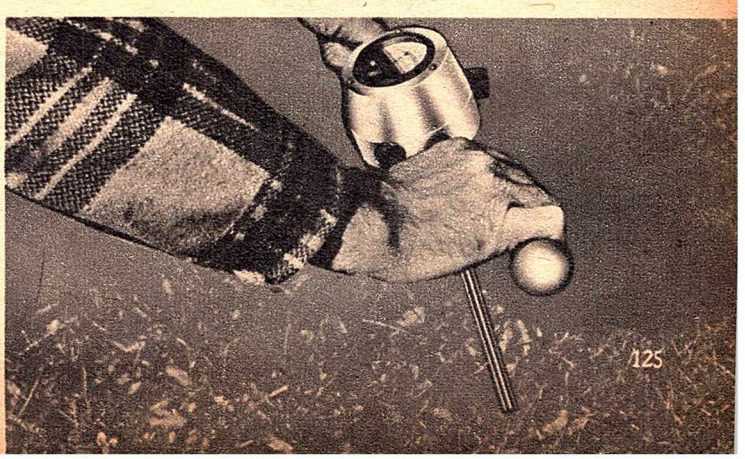


9. The Vibratory Earth Borer makes a fertilizing hole without removing any soil. Unit has 5½ hp engine, 7-ft. flexible shaft.

10. Gard'n Aid is used to transform clay soil into top soil by making the clay water receptive. For lawns, plants, trees, etc.

11. Aquaprobe determines the relative subsoil moisture up to 14-in. below ground level. Gadget operates with help of batteries.

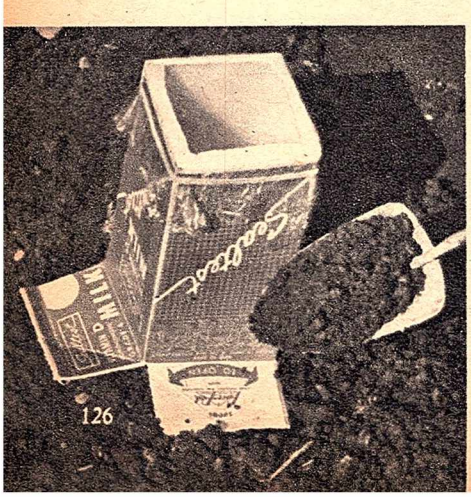
GUARD'N'AID
ORGANIC PLANT FOOD
AND SOIL CONDITIONER
MAKES CLAY WATER-RECEPTIVE
• for FLOWER BEDS, VEGETABLE PLOTS
• for NEW LAWNS, NEW PLANTINGS
• for "Side Dressing" Established Plants
ADDS NATURE'S OWN FOODS AT SAME TIME



GARDEN TIPS

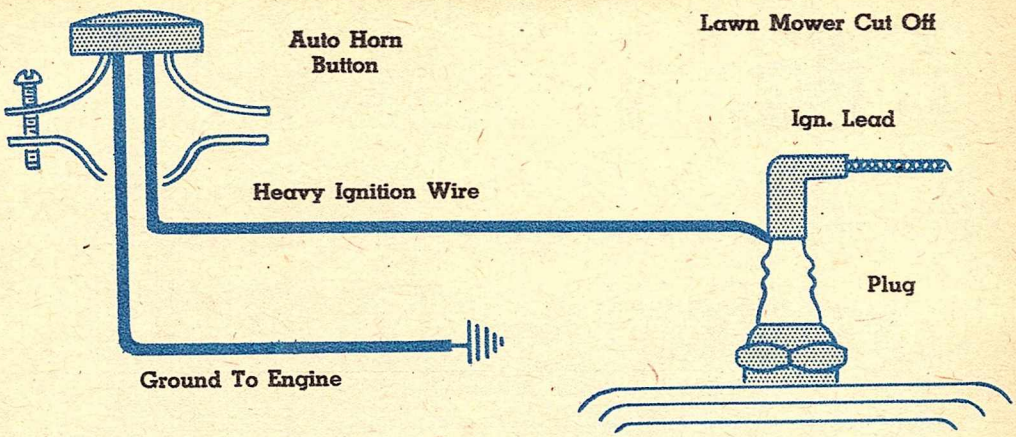
To keep plant labels on young trees legible, slip them into a small bottle and tie bottle to the tree.

Garden hot caps are made from milk containers. Bottom is cut out and replaced with plastic or cellophane.

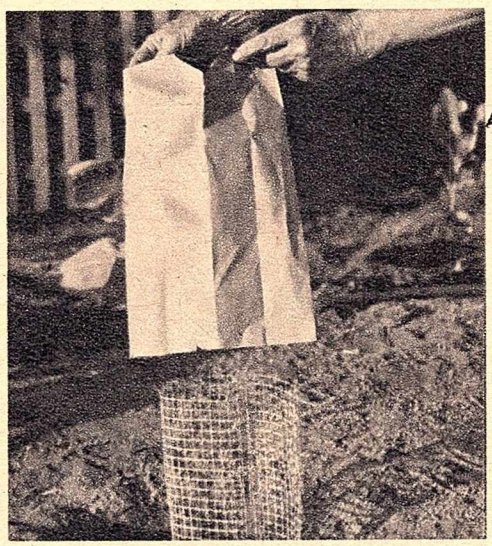


Cover freshly grafted nursery stock with plastic freezer bags. Besides keeping scions humid, bag protects grafts from birds.

Mix a little lubricating oil into a bucket of clean sand. The sand scours off dirt and leaves a protective oil film on tools.

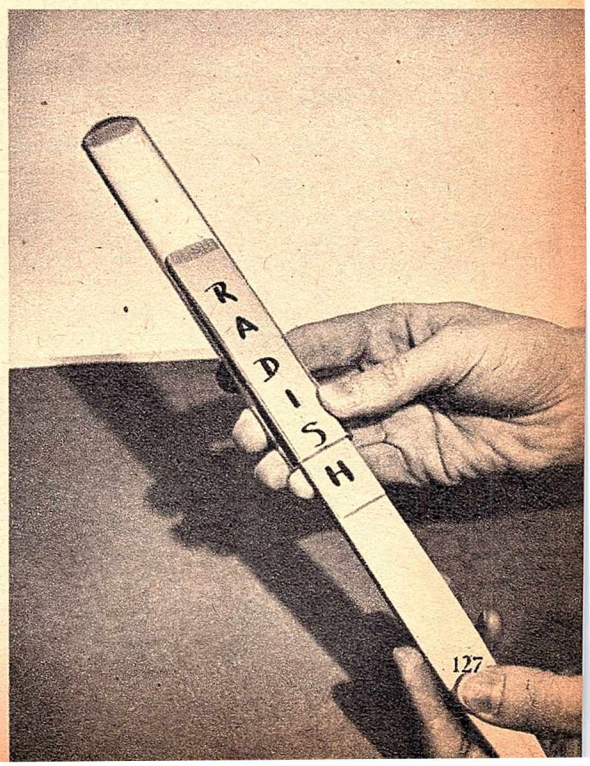


Lawn mower engine cut-off is mounted on mower handle. Pressing button shorts sparkplug.

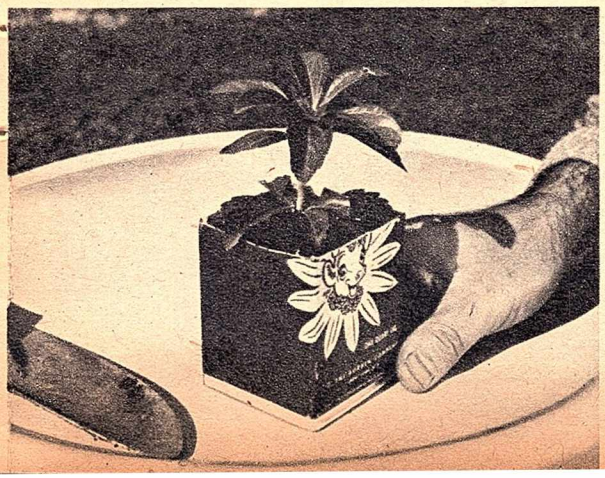


Young trees or shrubs are protected from rabbits, gophers, etc., with a basket of chicken wire, covered with vented paper bag.

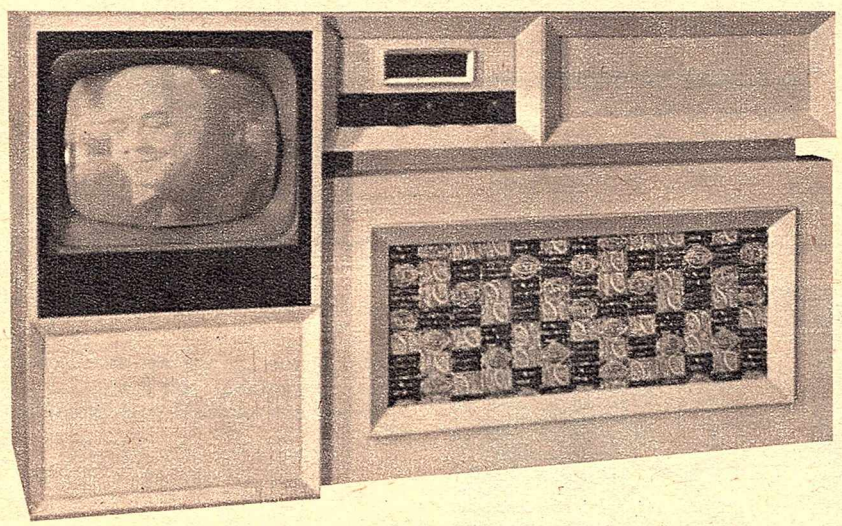
For a good garden marker, paste label on flat stick and thrust into ground. Cover label with glass tube, as shown in photo.



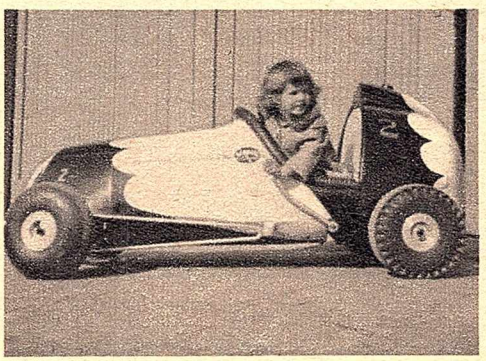
Milk container is handy for starting small plants; the wax covering seals in moisture.



Golden Hammer Award Winners

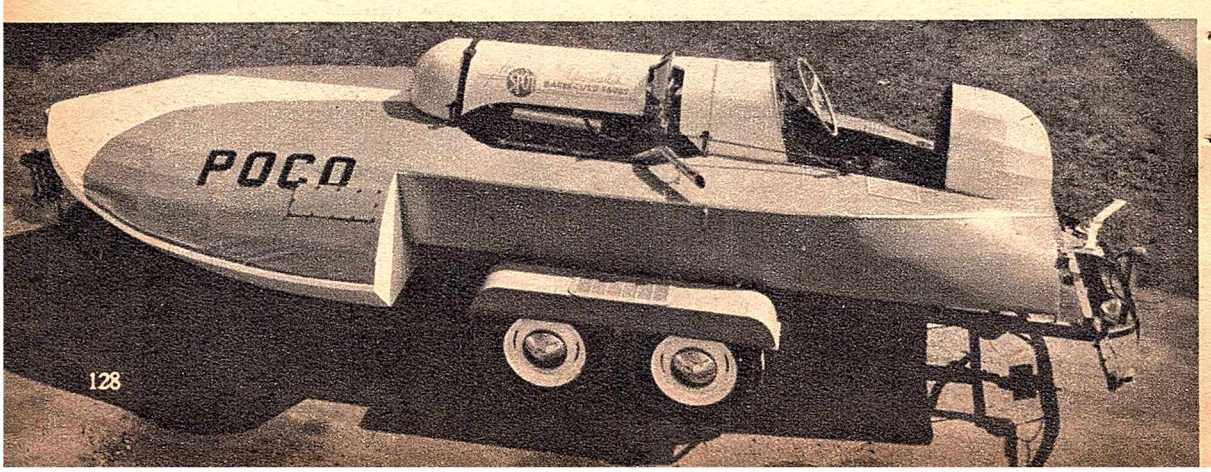


TV-radio combination includes 15-in. coaxial speaker, record changer, TV and radio set. Cabinet is ¾-in. plywood with mitered corners. T. O. DuVall, Atlanta, Ga.



Midget car has ½-in. galvanized pipe frame with body brazed to it. All parts, including wheels, were made by W. K. Hart, Sherman, Texas. Engine is 2 hp Continental.

Hydroplane is 20 feet long, has 8-foot beam. Supercharged Cadillac engine is said to give it a speed of 100 mph. Built by Phil Olson, South International Falls, Minn.



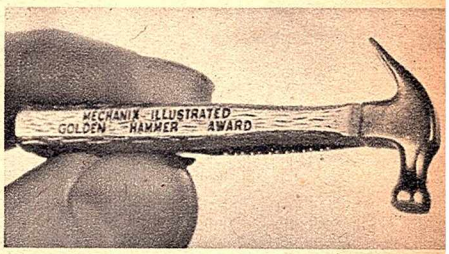
The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their project:

Q. P. Stagner, Tulsa, Okla. . . . Ronald Levesque, Epping, N. H. . . . Otto Burkhart, Omaha, Neb. . . . Bertrand Parker, San Diego, Cal. . . . R. L. Anderson, Morris, Canada . . . Charles Bohannon, Salem, Ore. . . . C. J. Parsons, El Cajon, Cal. . . . R. W. Jones, North Highlands, Cal. . . . Glenn N. Johnson, Larned, Kan. . . . Vince Bradley, Creston, Iowa . . . Earl E. Moffat, Sacramento, Cal. . . . William Sterner, Pittsburgh, Pa. . . . H. A. Speese, Roanoke, Va. . . . Hermann Miehle, Holmes, N. Y. . . . C. Smith, Brooklyn, N. Y. . . . Clifford C. Plumb, Ogden, Utah . . . Vecal P. Lager, Barrington, Ill. . . . Arthur D. Sollars, Gravity, Iowa . . . Larry Wilson, Minneapolis, [Continued on page 181]

Airplane is C.A.A. approved, has cruising speed of 160 mph; 100 hp engine, 20-foot wingspan, 19 ft. lg.; fabric covered steel fuselage. Dean Sackman, Beloit, Wisconsin.

House built in six months' time by Harry Kasik, Montreal, Canada. Most of the methods of construction for this 30x54 ft. home came from issues of Mechanix Illustrated.

Each craftsman whose project is shown has received a 24 karat gold-plated Hammer and a Workbench Award Certificate. How about sending us a photo and *full* description of your latest project? If you aren't a winner, you may still receive a 14 karat gold-plated Golden Hammer Tie Bar or MI's Certificate Of Merit. Photographs of you and your workshop are also eligible for an award. Send entries to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th Street, New York 36, New York. If you want entries returned, please enclose postage.



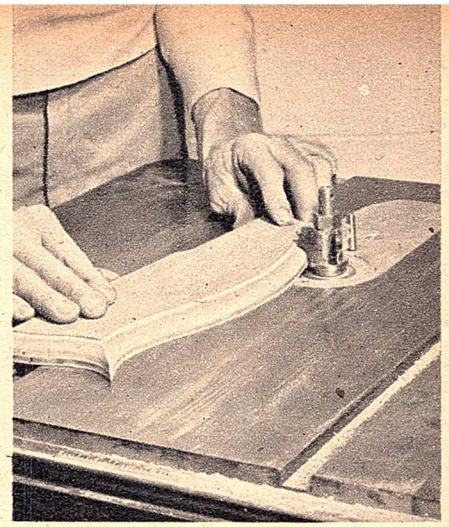
Twenty-five of these Golden Hammer Tie Bars are also awarded each month.

Runabout made from MI plan B-224 cost about $100 to build. With its 7½ hp outboard motor the boat planes with two people aboard. Linwood Giles, Boyerstown, Pa.

Modern desk built from MI plans by Geo. Teresinski, St. Joseph, Mo. The unit is constructed of fir plywood and completely covered with Formica for wear resistance.

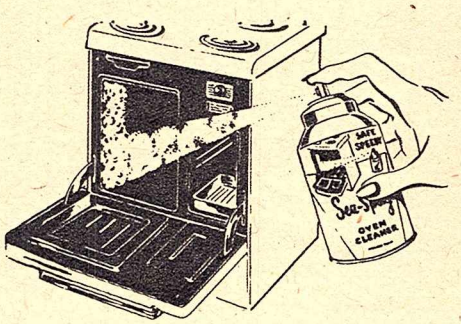
1. Hi-Fi speaker system uses a spherical enclosure for improved sound dispersion. It's plastic, has 18-in. diameter.

2. Sold in a plastic bottle, this all-purpose solder-flux paste is used to clean, flux and solder all common metals.



3. Attachment converts ordinary table saw into a shaper in a matter of minutes. Unit fits 10 different saw models.

New Products



4. Sea-Spray, a new non-poisonous chemical spray for cleaning ovens, is said to remove burned-on food and grease easily.

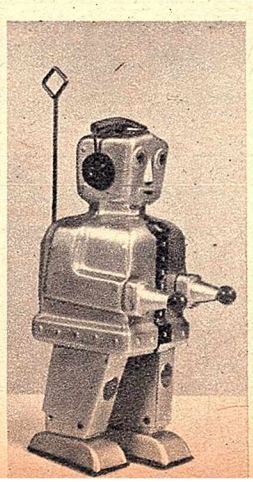
For more information write to:

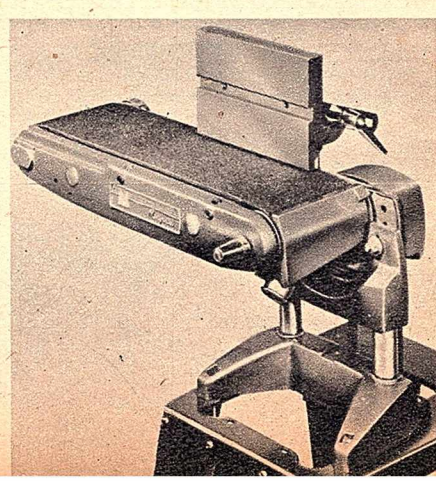
1. Plastilex Products Inc., 6515 North 10th St., Philadelphia 26, Pa.; 2. Anchor Metal Co., Inc., 244 Boerum St., Brooklyn 6, N. Y.; 3. Lee Tool Co., P.O. Box 12, Galesburg, Ill.; 4. Daycon Products Co., 418 Sixth St., N.W., Washington 1, D. C.; 5. Eastman Chemical Products, Inc., Kingsport, Tenn.; 6. Mahaffey's, Box 245, Artesia, Calif.; 7. Magna Power Tool Corp., Menlo Park, Calif.; 8. Globe American Corp., Merchandise Mart Plaza, Chicago 54, Ill.; 9. Stenso Lettering Co., Industrial Bldg., Baltimore 2, Md.; 10. Moen Valve Co., 6518 Ravenna Ave., Seattle 15, Wash.; 11. J & S Mfg. Co., 2645 S. State St., Chicago 16, Ill.; 12. Cellomatic Sales Corp., 186 N. Canon Drive, Beverly Hills, Calif.; 13. Cobra Metal Hose, Div. of DK Mfg. Co., 4640 W. 54 St., Chicago, Ill.

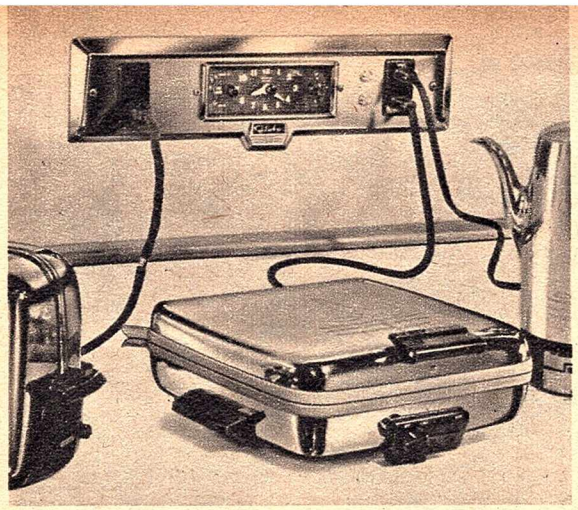
5. Easy-Fit arm rest cover is molded plastic, provides protection for new upholstery or conceals worn arm rest in car.

6. All-steel mechanical robot is wound with a key and sparks as it walks. The imported toy is 7 inches tall.

7. A new addition to the Magna line of individual power tools is this 6-inch belt sander. It's used horizontally or vertically.

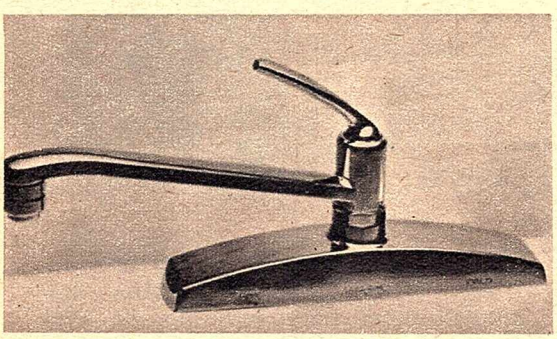




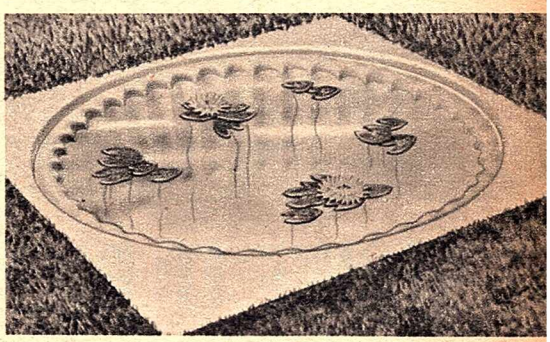


8. The Electropanel converts 220 v current to 110 v, permits housewives to use four appliances without danger of overloading.

9. Stencil lettering guides come in Roman, Gothic and Old English letters, in sizes ½ to 2½ in.; they can be used many times.



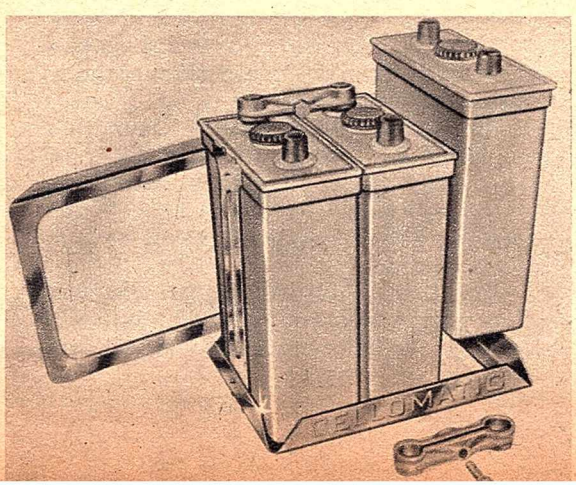
10. New type mixing faucet has only one handle. With finger tip motion, you can mix hot and cold water at any pressure.

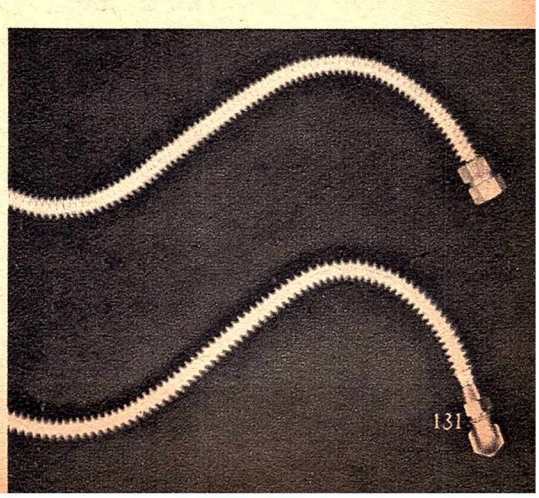


11. Molded plastic garden pool has 48x48 in. overall dimensions, 12-in. deep. The drain-equipped pool holds 75 gallons of water.

12. Cellomatic auto battery has replaceable cells. This arrangement allows user to change individual cells when they go bad.

13. Cobra flexible gas connectors allow you to move gas appliances away from walls and floors for easy cleaning and painting.





STRIKE IT RICH

WITH A SCINTILLATION COUNTER

The scintillator's sensitivity makes it superior to any Geiger counter.

By Jim V. Cavaseno

IT has long been the custom in the electronic age to simplify any device after once it has been invented. We have tried this with the scintillometer, an instrument used for the measuring of radioactivity. The unit described in this article has been designed for prospecting and searching for uranium and has been simplified to the extent that its accuracy of readings is slightly off as compared to lab jobs, but its sensitivity is excellent for prospecting and it compares favorably with commercial instruments.

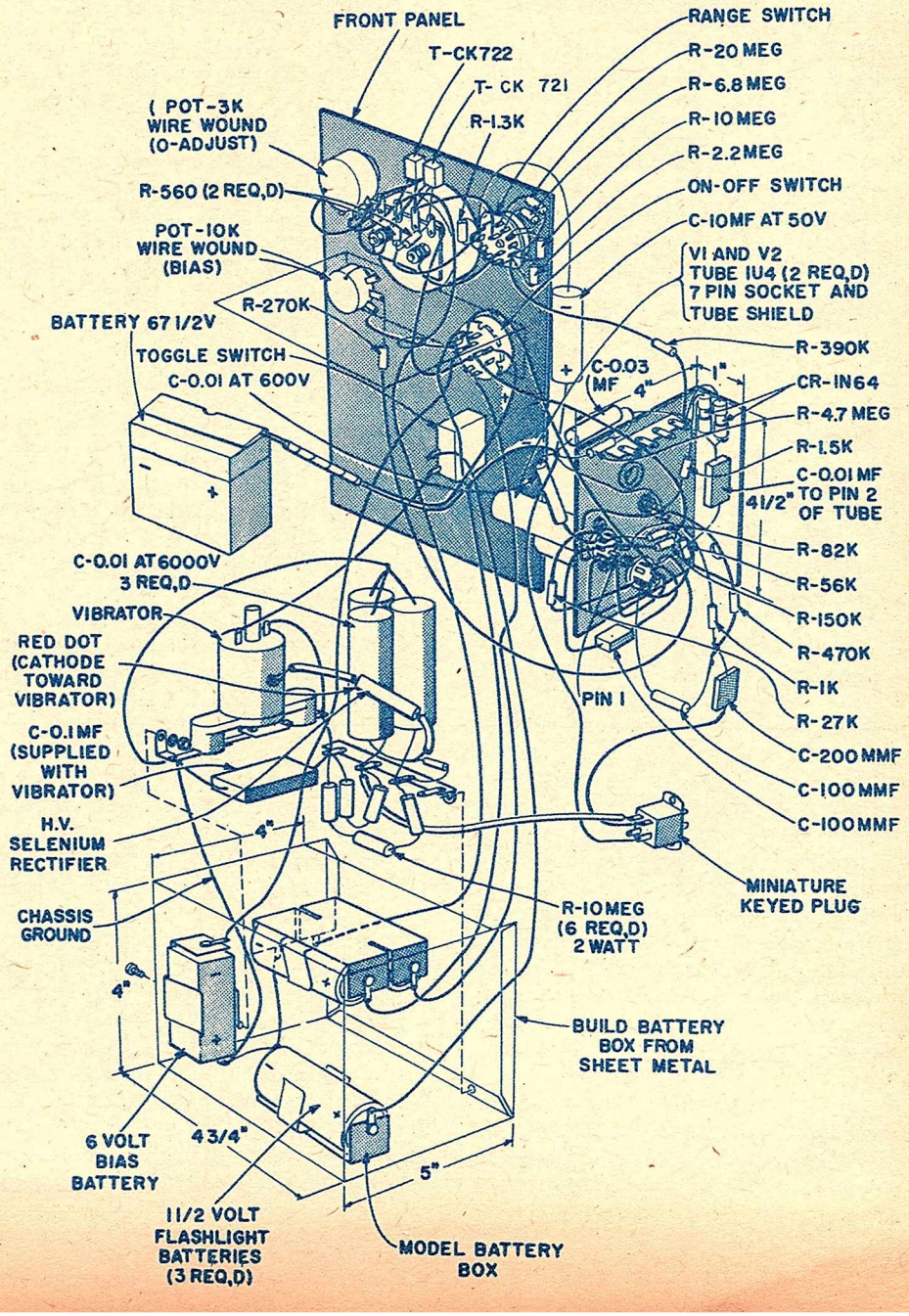
We went prospecting around the southwestern part of Colorado and though we didn't strike it rich, we had a good time and gained a wealth of experience. Mainly we were able to determine just how good the instrument here described would be for a prospector. We also took along some tools and test equipment so we were able to make changes in the design of the scintillation counter as ways were found to improve it. This we did a few times while we were out there, and we now have, we believe, the best possible scintillometer for prospecting use. We found quite a few different species of rock containing uranium, but there are a lot of loose radio active rocks around Colorado's mountains. The problem is to trace them back to the place they came from, to find the so called mother lode. When you have done this, you'll never have to work again.

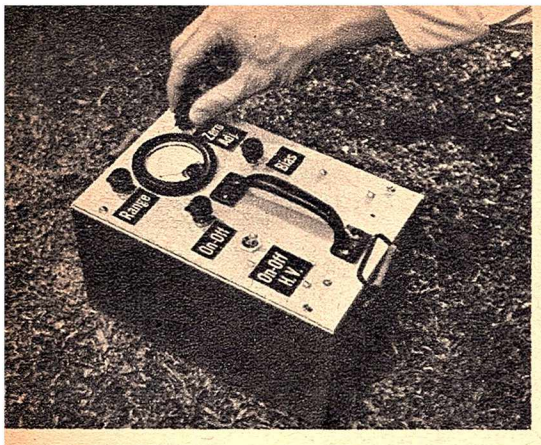
There are many companies who will buy good claims, but never be hasty in selling. Get the best deal you can, but

be sure you don't sell out completely. Always keep a certain amount of stock for yourself so that if the claim develops into a well paying mine, you'll always get your cut.

We were able to simplify the scintillometer by using a simpler circuit, and making the whole instrument lighter to carry. The last is very important, as anything you carry for long periods seems to become much heavier.

Five different parts are required for a scintillation counter. The detector to pick up radio activity and convert it into electrical pulses; the counting circuit to amplify the pulses; a form of discrimina-





Last step in readying the counter is the adjusting of the zero control on the meter.

The detector is built into a probe unit for greater mobility and ease of handling.

tor circuit whose output voltage will be a measure of the frequency of the pulses being fed into it; a voltmeter circuit to measure the output of the discriminator, and lastly, the voltage supplies for the various sections.

We decided to build the detector into a probe unit for two reasons. First, it would be more useful that way since a smaller detector will fit into smaller cracks and holes, and being at the end of a cable, it may be let down a cliff or other inaccessible place without endangering yourself. Secondly, the main cabinet doesn't need to be carried by hand. It can be fitted with straps for carrying on the shoulder. We used one strap around the shoulder and another around the waist; this way it isn't loose enough to bounce around when you bend, walk or jump.

The detector consists of a 6199 photomultiplier tube, a sodium iodide crystal (thallium activated), one inch in diameter by ½ inch thick; nine 10 meg ½-watt resistors, one 20 meg ½-watt (these must be 5% or better), three 220 mfd mica condensers (these are not critical); the socket for the 6199 phototube which is a standard TV picture tube socket, except that it has all twelve pin connections and is known as a duodecal socket, and a piece of three-wire shielded cable (not longer than ten feet).

The counting circuit consists of a more or less standard multi-vibrator with the second tube biased to a point where it will only oscillate when a pulse is fed to it, and will cease oscillating when the pulses fed to it are stopped. The arrangement of this circuit is such, that when it starts oscillating, the amplitude of the signal will be constant, regardless of the amplitude of the pulses being fed to it. However, the amplitude of the generated signal will vary if the frequency of the pulses being fed to it is changed. The lower frequency pulses fed to it correspond to a higher amplitude generated signal. The signal from the generator is fed to the discriminator circuit, which is made up of the two 1N64 crystal diodes, the 4.7 meg resistor and .03 mfd condenser, and the 1500 ohm ½-watt resistor. The DC output of this circuit is then dependent on the frequency of the pulses being fed into the multivibrator circuit.

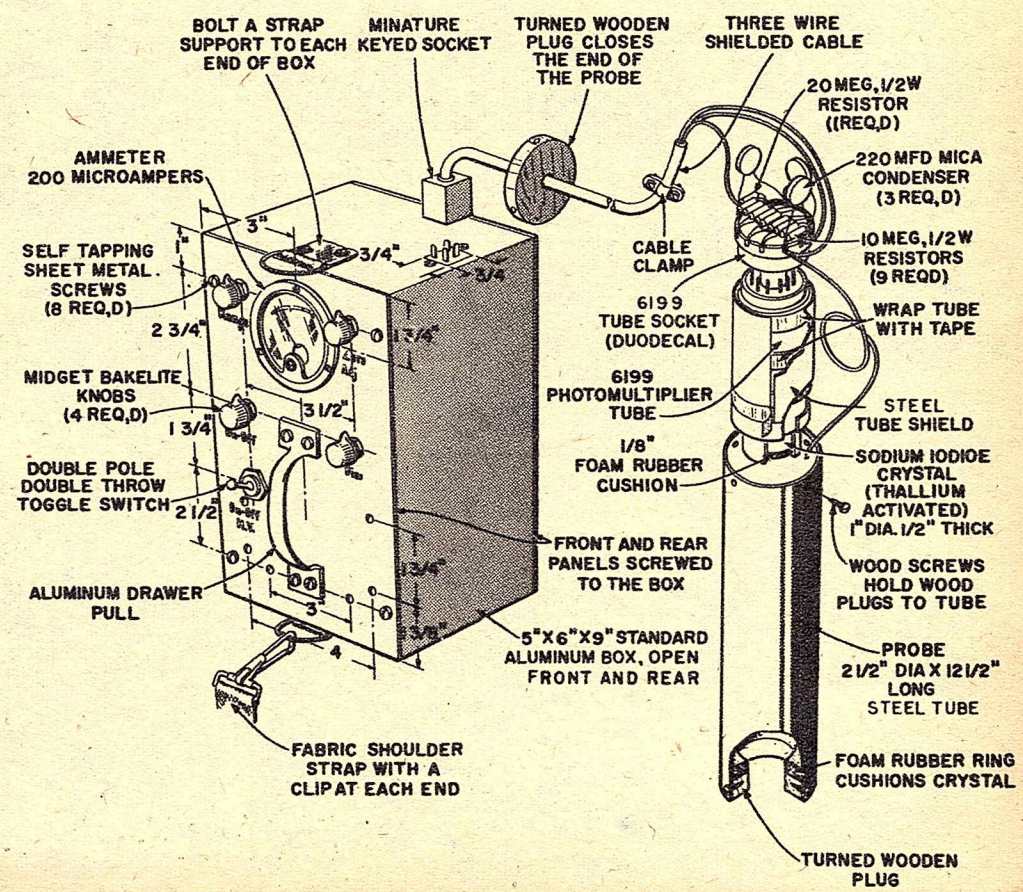
The meter circuit is nothing more than a DC voltmeter, transistorized to increase the sensitivity of the meter.

Voltage supplies for the various circuits are batteries, except for the 1,000 volts required to operate the 6199 phototube; this is supplied by a vibrator high voltage supply circuit. It comes in two parts. The vibrator has a self contained autotransformer and is about four inches square by 1½ inches thick, and is all wired for use. All that need be done is to connect in the two flashlight batteries and the switch. The high voltage selenium is about two inches long, ¼-inch in diameter. It is designed to handle up to 5,000 volts. The output of this circuit is about 2,000 to 4,000 volts, depending on the adjustment of

the vibrator points which are adjustable with a screwdriver. Six 10 meg 2-watt resistors are used to drop the voltage out of the selenium. The value of these are .001. These condensers will hold their charge for about five minutes after the vibrator has been shut off, and therefore, the instrument will still operate for that length of time. If larger condensers are used, the charge may be held for a longer period of time. Of course, the quality of the condensers used will have a greater effect on the time they will hold a charge than the value in mfds.

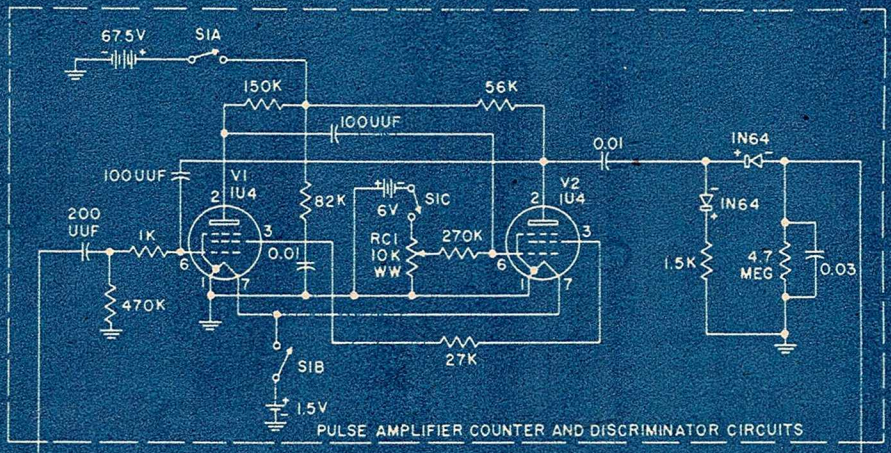
The total cost of the parts for the HV supply is only a little less than the price of three 300-volt batteries which would be just as good, so one may wonder why we went to the bother of building our circuit. For one thing, it is much lighter to carry, and secondly, if we used batteries after they wore out, new ones would be required at their high cost as compared to the 25 cents for the two flashlight batteries used in our circuit. Naturally, if one desires, he may use HV batteries and thereby simplify construction.

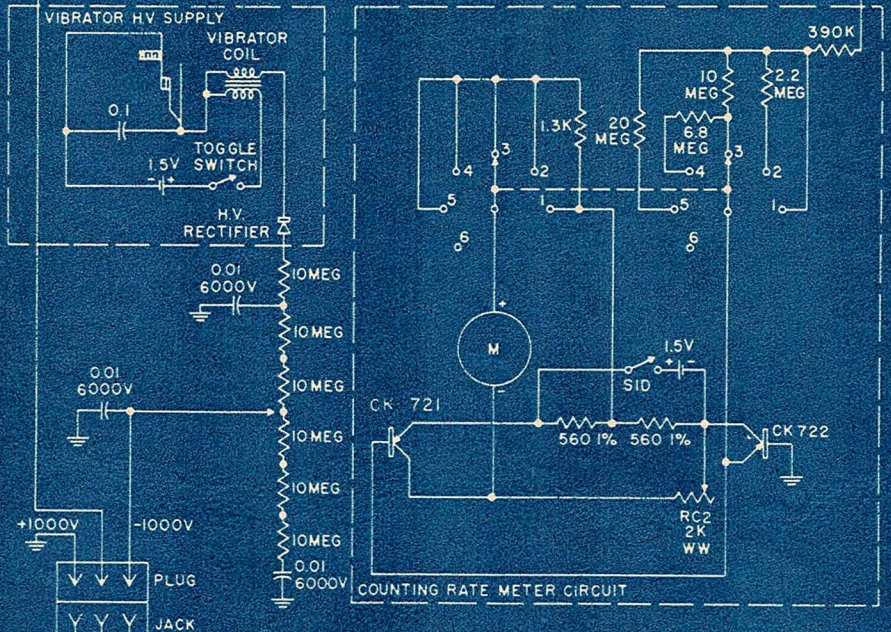
The main cabinet contains the meter and the four controls as shown in the photos. The sensitivity switch is on the upper left, meter zero adj. on the upper right hand corner, bias adjust on the lower right, and the on-off switch on the lower left. These controls are placed as close as possible to the meter to make sure they will clear the sides of the cabinet, but re-check before you drill the holes. There is a second on-off switch on the side of the cabinet. This is for the HV circuit. As stated before, if we can turn off the vibrator and still leave the rest of the set on, it will continue to operate for about five minutes off the


BOLT A STRAP SUPPORT TO EACH END OF BOX
MINATURE KEYED SOCKET
TURNED WOODEN PLUG CLOSES THE END OF THE PROBE
THREE WIRE SHIELDED CABLE
20 MEG, 1/2W RESISTOR ((REQ,D)
AMMETER 200 MICROAMPERS
220 MFD MICA CONDENSER (3 REQ,D)
SELF TAPPING SHEET METAL SCREWS (8 REQ,D)
CABLE CLAMP
10 MEG, 1/2W RESISTORS (9 REQD)
6199 TUBE SOCKET (DUODECAL)
WRAP TUBE WITH TAPE
MIDGET BAKELITE KNOBS (4 REQ,D)
6199 PHOTOMULTIPLIER TUBE
STEEL TUBE SHIELD
1/8" FOAM RUBBER CUSHION
SODIUM IODIDE CRYSTAL (THALLIUM ACTIVATED) 1" DIA. 1/2" THICK
DOUBLE POLE DOUBLE THROW TOGGLE SWITCH
FRONT AND REAR PANELS SCREWED TO THE BOX
WOOD SCREWS HOLD WOOD PLUGS TO TUBE
ALUMINUM DRAWER PULL
5"X6"X9" STANDARD ALUMINUM BOX, OPEN FRONT AND REAR
PROBE 2 1/2" DIA X 12 1/2" LONG STEEL TUBE
FABRIC SHOULDER STRAP WITH A CLIP AT EACH END
FOAM RUBBER RING CUSHIONS CRYSTAL
TURNED WOODEN PLUG

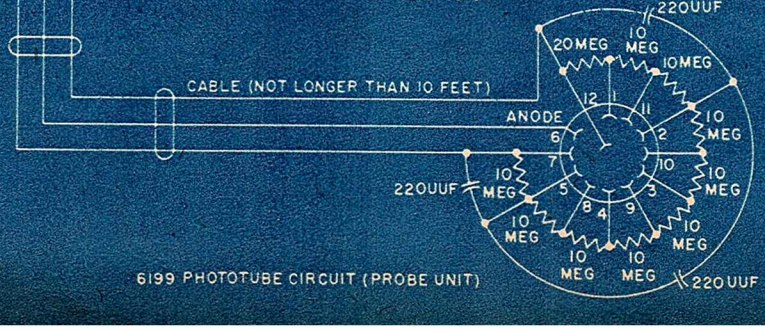
charged HV condensers. After this, the vibrator is again turned on for a few seconds to recharge the condensers. The batteries that operate it last about three hours running steady, and we found that they gave us an average of about two days service in actual use.

Start construction by obtaining a metal box large enough to hold all the components [*Continued on page* 162]



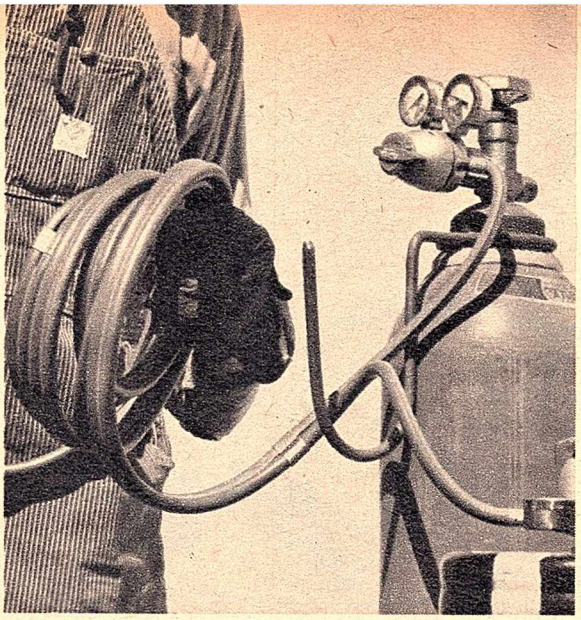


ALL RESISTORS MOUNTED ON SOCKET ARE 1/2W 5%

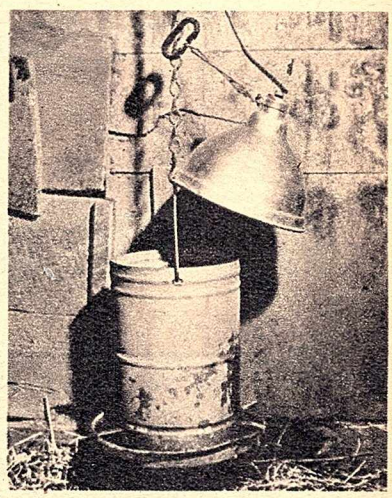


6199 PHOTOTUBE CIRCUIT (PROBE UNIT)

The Farmer's Page



Hose on acetylene welder lasts longer when coiled and hung on a hook fitted over the cylinder neck. Hook is made from a 30-in. length of ⅜-in. rod.



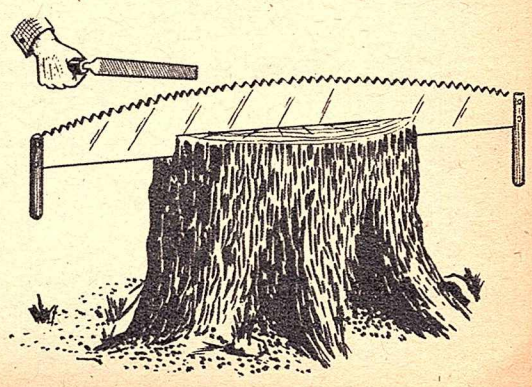
Right: chicken water supply won't freeze if suspended and heated with an infrared lamp.

To remove colored lettering from a flour or feed bag, shake it well, pour kerosene on the lettering and roll up tight for a few days; then boil in lye water, rinse.

This mail box can be moved for road work or snow clearance. Channel iron is set into a soil-filled, concrete-topped milk can.

Use the method shown below when repeated sharpening of a crosscut saw is required. Make a cut about 4 in. deep in the stump.

SHARPEN TWO-MAN SAW ON LOCATION BY INVERTING INTO SAWCUT MADE IN STUMP

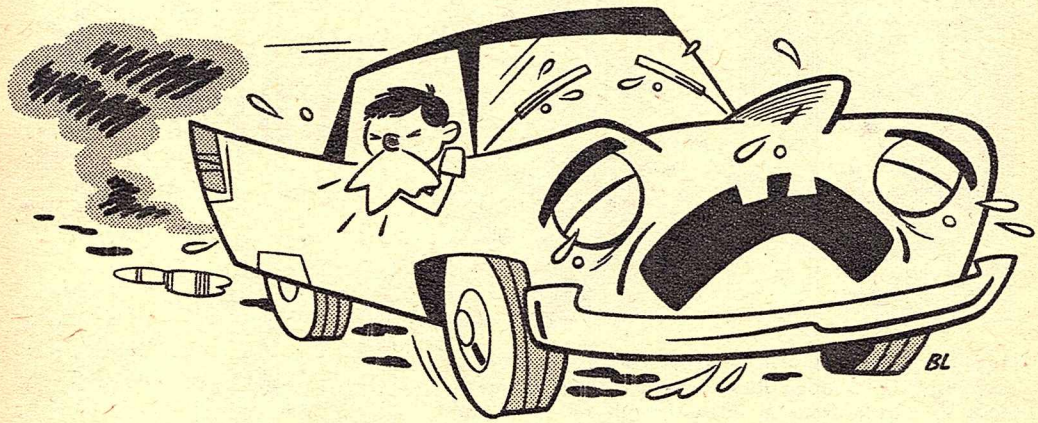


CARE WILL SAVE YOUR CAR

CAR CARE

By Frederick C. Russell

Member, Society of Automotive Engineers.



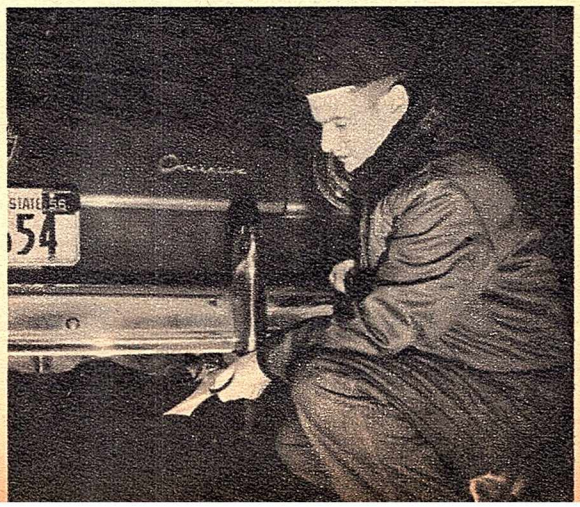
Are You Driving a Dripper?

DON'T look now, but that leak in your pocketbook probably is due to a series of holes in various parts of your car. Your money is steadily dripping away because you are paying for troubles caused by that great enemy of car health—leakage.

In those long black lines that darken concrete highways is a fortune in oil, grease and other fluids, lost from leaky cars. And that's only part of the story. Most of such leakage has no such obvious source. Compression loss through leaking rings has no visible sign but it opens wider that pocketbook rupture through which your dollars disappear. You can't see an air leak in the short, flexible hose between the main fuel line

To find out if windows leak, play hose at car. Have assistant inside to watch leakage.

Oil vapor from exhaust is easier detected if you hold white paper against the pipe.



and the fuel pump but it may tie up on the road with what amounts to vapor lock.

But even the leakage that is apparent often isn't easy to check. That bluish white smoke coming from the exhaust pipe means that oil is sucking into the cylinder combustion chambers, but you might not know that this is due to worn intake valve guides. Every time an intake valve opens, the piston for that particular cylinder sucks in a mixture from the intake. If the intake valve guide is worn, oil will be drawn from the valve compartment. Oil may also be going out the exhaust as smoke because oil pressure is too high. In this case, oil is tossed off the bearings and thrown to the cylinder walls in excessive amounts. Any such over-oiling has the same effect as oil leakage.

The radiator overflow pipe is one of the things to watch when faced with the problem of coolant loss. It can play some strange tricks, but at the same time is a good clue to engine condition as well as any errors the owner makes in caring for his car. Coolant will go out the overflow if the lower hose collapses but it can also be lost through the owner over-filling the radiator when the engine is cold. Even with a pressure cap coolant will force open the cap's valve if water flow is blocked off at the lower hose. The valve will also be forced open if not enough space has been allowed for expansion when the coolant heats up.

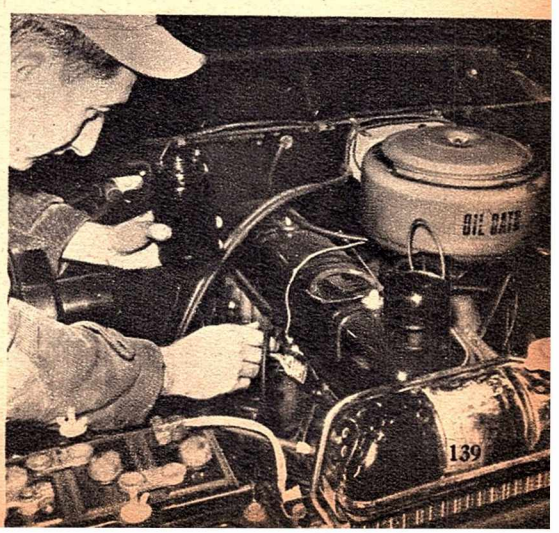
In one recent case the overflow pipe

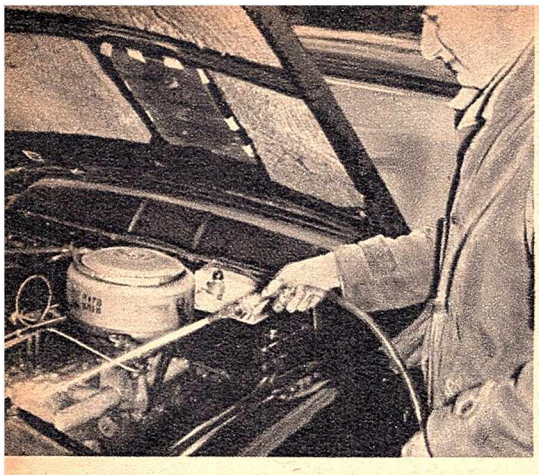
Rain drives through worn or loose antenna bushing. Check, and tighten it with pliers.

Common point of leakage is door weatherstripping. Fix parts with rubber cement.

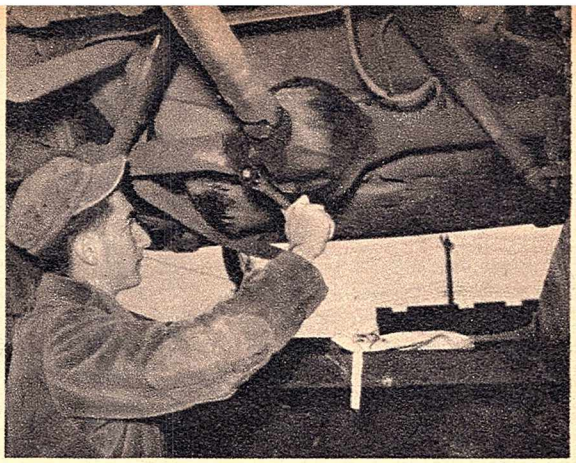
Loose crankcase bolts are tightened with an extension arm on the socket wrench.

To spot leak, dab clean engine with Gunk, an oil emulsifier, diluted with kerosene.





Immediately after application of Gunk, the engine is hosed down with cold water.



Use socket wrench to tighten nuts around differential. Examine again after 100 miles.

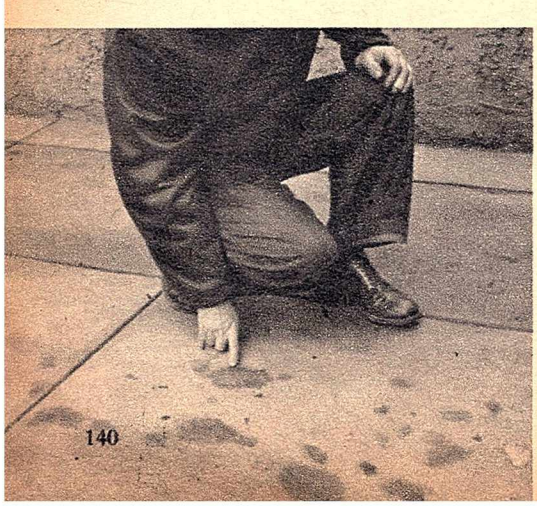
was badly dented near its lower opening by a stone tossed up from the road. Expansion occurred, and when the water could not escape through the usual exit it forced open a radiator seam. Leaks often develop in the cooling system of trucks because their overflow pipe becomes clogged with dirt and mud.

If you accidentally overfill a cold radiator be sure to check after the engine has thoroughly warmed up, because when expansion takes place quite a lot of coolant will syphon out. On a torrid day this would make a difference, especially when caught in a traffic jam. If water does force the cap's valve open, your tip-off is a peculiar sound under the hood like a muffled squeal—just momentarily.

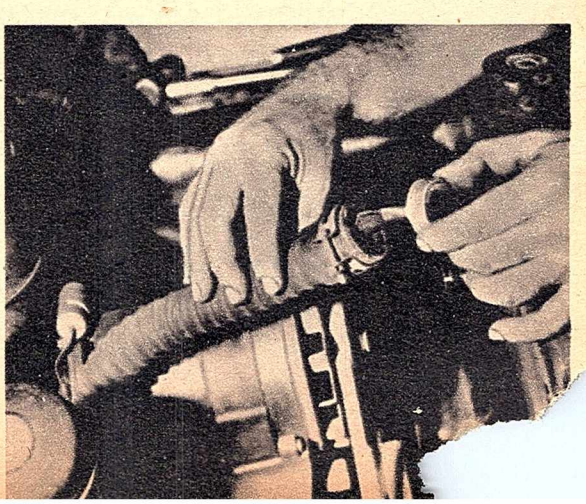
One kind of leagage that is as disturbing as it is unnecessary, is having the rear-end lubricant work past the rear axle bearings into the brakes. This happens either because the rear axle housing is overfilled or because the retainers are worn, or both. But don't tear your hair if, after a new retainer is installed, you have the same trouble all over again. It is due to failure to soak the retainer in oil before installation—it must be soft and pliable or it won't seal properly.

Fortunately we have some handy leak stoppers these days. It used to be heresy to use anything in the radiator to stop a leak. But today, in the best shops, they use a sealer when installing the winter's supply of anti-freeze. No less an authority on cooling system efficiency than the makers of Prestone were this spring offering a heavy duty sealer

Common sight on garage floor is oil stain. Check car immediately for leakage.



Seal hose connections before installation. Always get surfaces as clean as possible.



Some slight leakage around crankcase is inevitable, but heavy stains mean trouble.

Heavy black stains around this differential should be given your immediate attention.

which is said to leave a "metal hard" protective coating over points of serious leakage. It is important that the various chemicals used in the cooling system be reasonably compatible with each other —a goal which makers of cooling system aids have achieved to a remarkable degree.

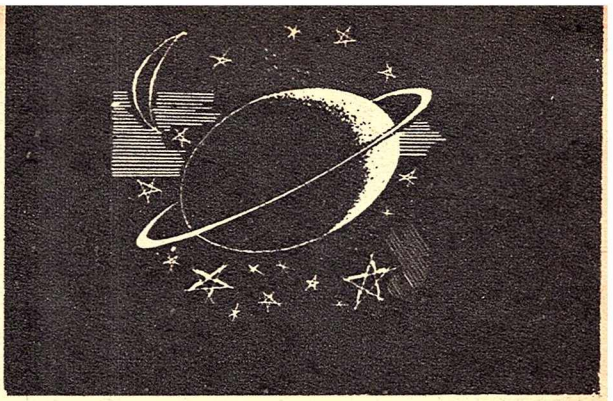
We also have some special gasket forming materials to stop leakages which develop near the outside of the cooling system. Some years ago we were annoyed because of a leak in a metal connection for our hot water heater. Mixing up a paste of powdered metal we applied this to the affected area and can report that after 60,000 miles of service it is still holding. One thing that helps in fighting any kind of leakage around the car is cleanliness. See how it works around radiator hose connections. If the metal is carefully cleaned and polished a new hose can be fitted without using a binder. Of course, if the metal cannot be polished because it is badly corroded, or if there is any question about the hose fitting tightly, this is the right spot for an application of gasket forming material.

The next most important factor in checking leakage is the following of the proper sequence when tightening the cylinder head. The order of tightening differs for various engines. Unless it is followed, the head may be warped and that means not only a chance of coolant loss inside or outside the engine, but combustion gas leakage as well. If gases escape into the cooling system you'll know it by the way water will be forced forward violently into the radiator top when the engine is accelerated. If the escape is external you'll hear a sharp canary-like whistle when you step on the accelerator.

Some very troublesome leakage spots have come into the picture in the past few years. Way on top of this new list is the cover of the oil filter which suffers from a too narrow area of contact with the filter shell, and also from a very narrow gasket. Unless the gasket and cover are put back carefully all of the engine's oil may be lost at this point in a comparatively short run. The problem has been neatly solved by the Permatex Company which offers Form-a-Gasket, a sealing [*Continued on page* 156]

Avoid serious oil loss at oil filter by application of sealing compound to filter cover.

The Amateur Telescope Maker's Page

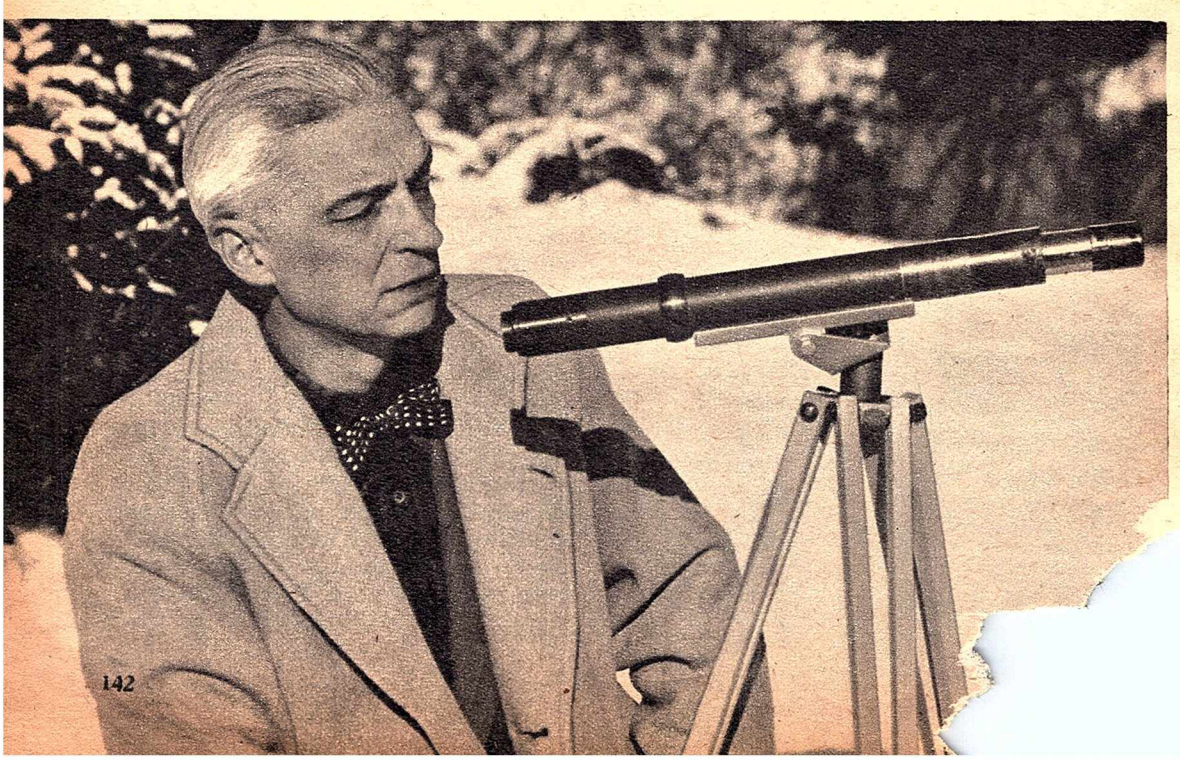


How to convert a pair of three-power war surplus telescopes into a twenty-power terrestrial telescope; cost, eight dollars.

ONE of the biggest optical bargains on the market is the war surplus M-70 three-power telescope. These telescopes were made for the government by Bell and Howell, probably at a cost of $100 and are now available from the Edmund Scientific Corporation in Barrington, New Jersey for the low sum of $4 each. A pair of these instruments will enable you to make a very fine 20-power terrestrial telescope.

So, the first thing to do is to nail down a pair of M-70's. We need two of these scopes for the necessary parts. Next get a set of small screwdrivers. The U. S. Army put enough flatheaded screws, including headless ones, into these jobs to withstand heavy gun fire.

And now with the two M-70's on the work table let's get busy. First remove the three screws in the center of the tube and unscrew the upper half (note

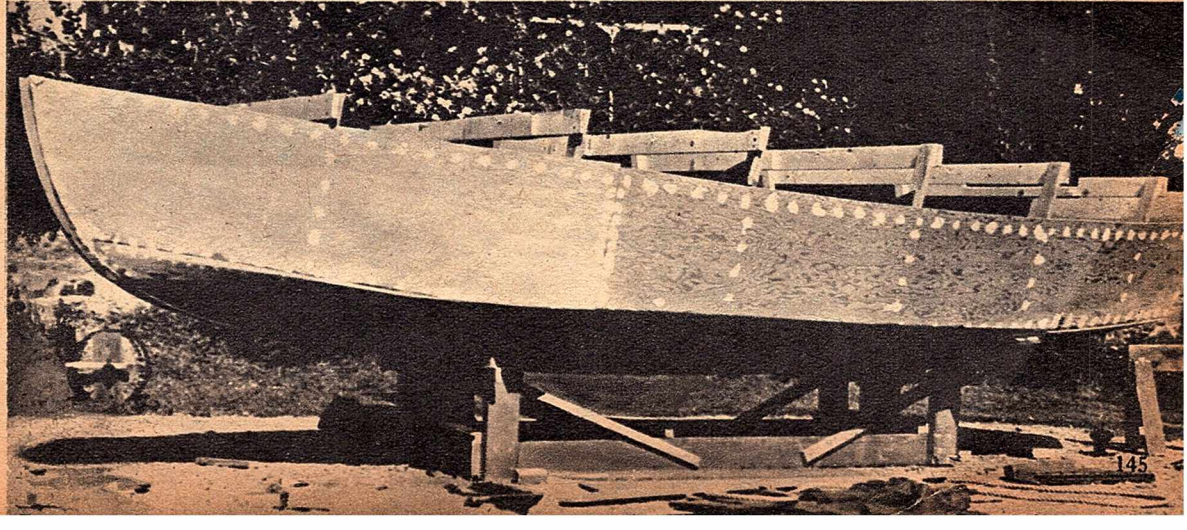


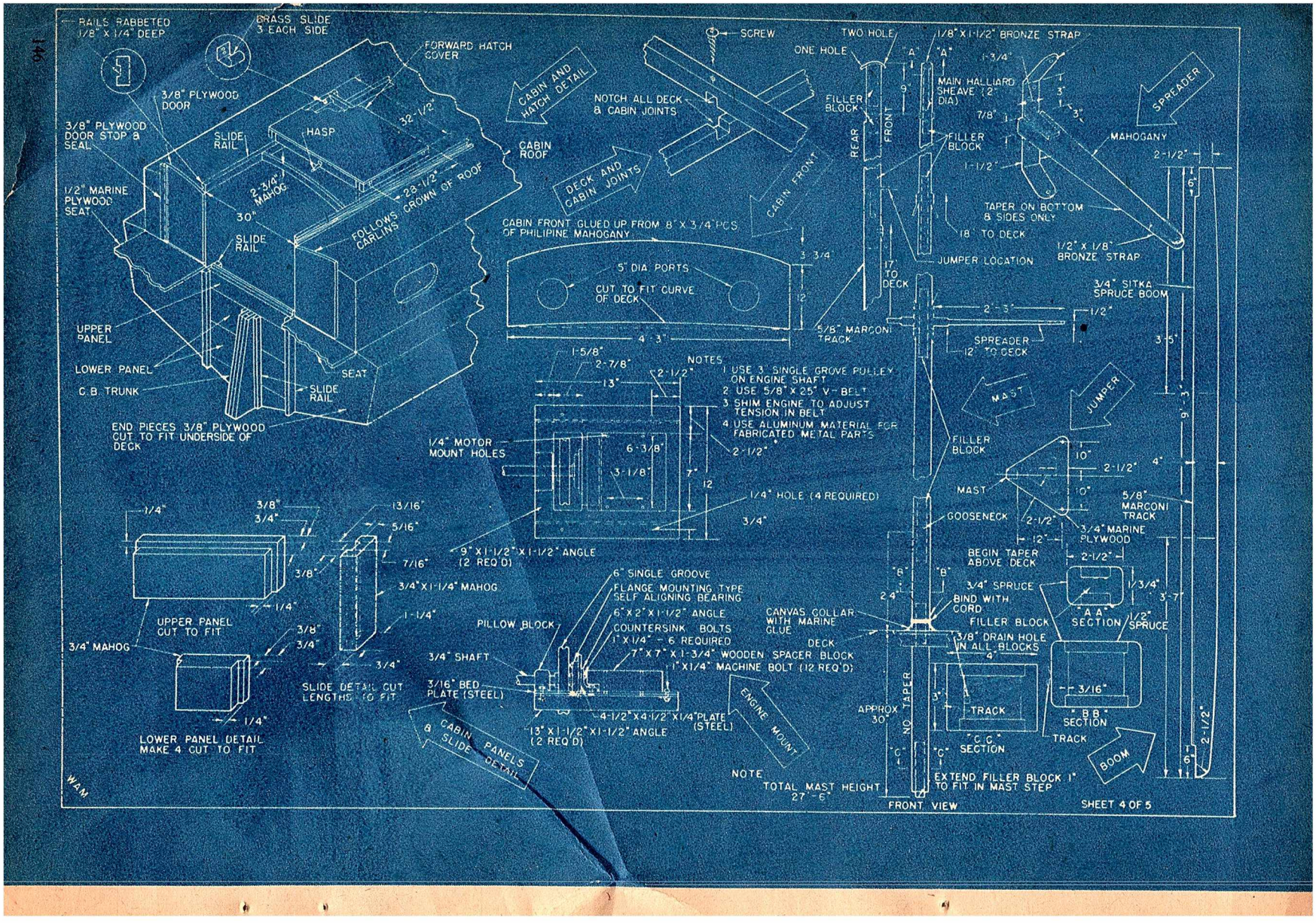
Bonnie II, a lot of boat for its size, offers many hours of pleasure for the builder.

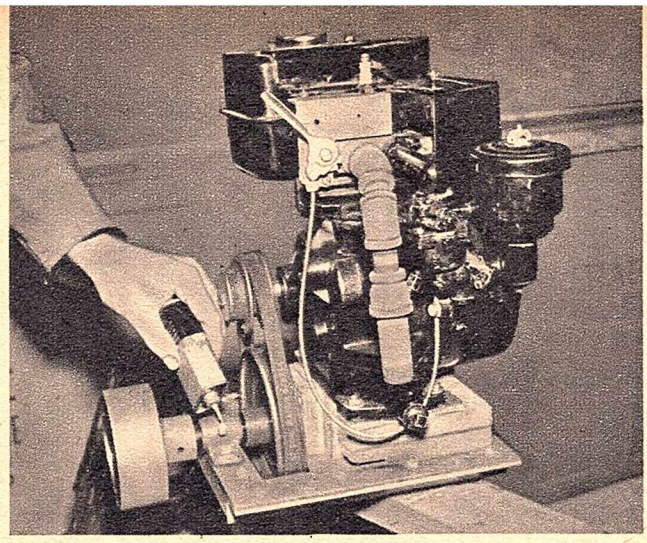
beveled even with the latter. Follow the exact same procedure to plank the bottom, placing flannel and glue along keel, chine, stem and transom. It will be necessary, however, in the case of the bottom to put both short panels at the bow, as a 12-ft. length is too hard to manipulate into the stem. Put in the bow panels first, clamping the aft ends to keelson and chine, then working the forward ends gradually down to the stem.

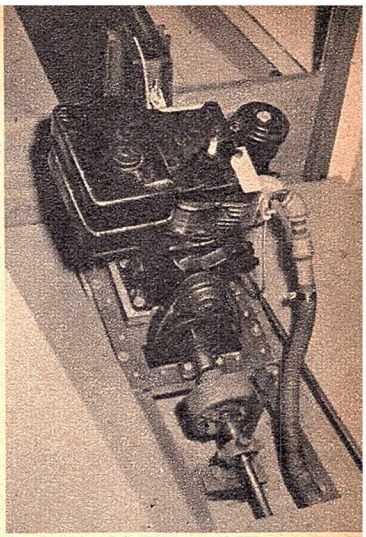
You may have to use the hot towel treatment on these pieces in order to ease them into the twist at the bow, but this is a very easy task. Simply heat a large pot of water over the kitchen stove until it is boiling. Place a big bath towel on top of the panel and slowly pour the boiling water over it, until you can feel the warmth with your hand on the underside of the wood. Whip off the towel and push the end of the piece down toward the stem. You will be surprised at how much more yielding the heat treatment has made the plywood.

After planking, hull is turned over. Projecting frames are sawed off as work continues.




RAILS RABBETED 1/8" X 1/4" DEEP
BRASS SLIDE 3 EACH SIDE
FORWARD HATCH COVER
3/8" PLYWOOD DOOR
3/8" PLYWOOD DOOR STOP & SEAL
SLIDE RAIL
HASP
32-1/2"
CABIN ROOF
2-3/4" MAHOG.
23-1/2"
30"
FOLLOWS CROWN OF ROOF
1/2" MARINE PLYWOOD SEAT
SLIDE RAIL
UPPER PANEL
LOWER PANEL
C.B. TRUNK
SEAT
SLIDE RAIL
END PIECES 3/8" PLYWOOD CUT TO FIT UNDERSIDE OF DECK
CABIN AND HATCH DETAIL
SCREW
NOTCH ALL DECK & CABIN JOINTS
DECK AND CABIN JOINTS
CABIN FRONT
CABIN FRONT GLUED UP FROM 8" X 3/4" PCS OF PHILIPINE MAHOGANY
5" DIA PORTS
CUT TO FIT CURVE OF DECK
3-3/4
12"
4'-3"
5/8" MARCONI TRACK
NOTES
1 USE 3 SINGLE GROVE PULLEY ON ENGINE SHAFT
2 USE 5/8" X 25" V-BELT
3 SHIM ENGINE TO ADJUST TENSION IN BELT
4 USE ALUMINUM MATERIAL FOR FABRICATED METAL PARTS
1/4" MOTOR MOUNT HOLES
1-5/8"
2-7/8"
2-1/2"
13"
6-3/8"
3-1/8"
7"
12
2-1/2"
1/4" HOLE (4 REQUIRED)
3/4"
1/4"
3/8"
3/4"
13/16"
5/16"
7/16"
3/8"
1/4"
3/4"X1-1/4" MAHOG
1-1/4"
3/8"
3/4"
3/4"
UPPER PANEL CUT TO FIT
3/4" MAHOG
LOWER PANEL DETAIL MAKE 4 CUT TO FIT
SLIDE DETAIL CUT LENGTHS TO FIT
9" X 1-1/2" X 1-1/2" ANGLE (2 REQ'D)
PILLOW BLOCK
3/4" SHAFT
3/16" BED PLATE (STEEL)
6" SINGLE GROOVE FLANGE MOUNTING TYPE SELF ALIGNING BEARING
6" X 2" X 1-1/2" ANGLE
COUNTERSINK BOLTS 1" X 1/4" - 6 REQUIRED
7" X 7" X 1-3/4" WOODEN SPACER BLOCK
1" X 1/4" MACHINE BOLT (12 REQ'D)
4-1/2" X 4-1/2" X 1/4" PLATE (STEEL)
13" X 1-1/2" X 1-1/2" ANGLE (2 REQ'D)
CANVAS COLLAR WITH MARINE GLUE
DECK
CABIN PANELS & SLIDE DETAIL
ENGINE MOUNT
NOTE
TOTAL MAST HEIGHT 27'-6"
SCREW
TWO HOLE
ONE HOLE
1/8" X 1-1/2" BRONZE STRAP
"A"
"A"
1-3/4"
FILLER BLOCK
REAR
FRONT
9"
MAIN HALLIARD SHEAVE (2" DIA)
3"
3"
7/8"
SPREADER
FILLER BLOCK
MAHOGANY
2-1/2"
1-1/2"
6"
TAPER ON BOTTOM & SIDES ONLY
18" TO DECK
1/2" X 1/8" BRONZE STRAP
JUMPER LOCATION
17" TO DECK
3/4" SITKA SPRUCE BOOM
2'-3"
1/2"
SPREADER 12" TO DECK
3'-5"
MAST
JUMPER
9'-3"
FILLER BLOCK
10"
2-1/2"
4"
MAST
10"
5/8" MARCONI TRACK
GOOSENECK
2-1/2"
3/4" MARINE PLYWOOD
12"
BEGIN TAPER ABOVE DECK
2-1/2"
"B"
"B"
24"
3/4" SPRUCE
BIND WITH CORD
FILLER BLOCK
3/8" DRAIN HOLE IN ALL BLOCKS
4"
1-3/4"
3'-7"
A A SECTION
1/2" SPRUCE
3/16"
B B SECTION
APPROX 30°
NO TAPER
3"
TRACK
"C" C SECTION
TRACK
BOOM
"C"
2-1/2"
6"
6"
EXTEND FILLER BLOCK 1" TO FIT IN MAST STEP
FRONT VIEW
SHEET 4 OF 5
WAM



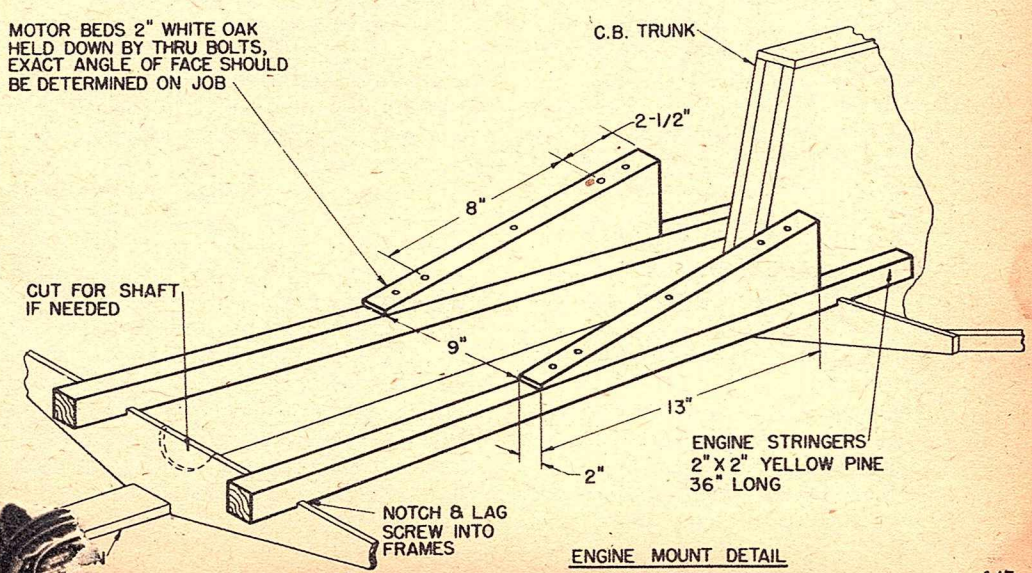


A Briggs and Stratton 2½-hp, air-cooled, single-cylinder engine, the same type used extensively for lawn mowers, is used for auxiliary power. The 2:1, belt-driven reduction gear is made up of stock pulleys and bearings. Picture at right shows engine installed.

When the panel has been forced to the stem put in several screws quickly to hold it. You now have it subdued and the rest is routine. The two long bottom panels will go on as easily as the side pieces. Space the screws at 2 in. on centers along the keel and stem, 3 in. along the chine and transom, 4 in. on the frames.

Bevel the edges of the bottom planking until they are flush with the sides and transom. Butt blocks may be put in at this time. In the original Bonnie leftover scraps of frame lumber were used for this purpose, but still better would be pieces about ¾x5 in. Set the butt blocks in flannel and marine glue, fastening with double rows of screws spaced at 3-in. intervals.

Next, cover all screw heads with Kuhl's trowel cement and fill the seams along keel, stem and butt joints with elastic seam compound. Caulking is unnecessary. Mark the waterline as shown in the plans, using a heavy pencil and a long batten, with a taut string rigged along the hull for a guide. Sand the bottom smooth and apply two coats



ENGINE MOUNT DETAIL

LARGE-SCALE PLANS

will greatly simplify construction. Send $5.00 to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Fawcett Place, Greenwich, Conn. Specify Bonnie II Plan No. B-233.

of copper bottom paint, red, green or bronze, coming just up to the waterline.

The boat is now ready to be turned over and you will need to make a cradle for it to rest on.

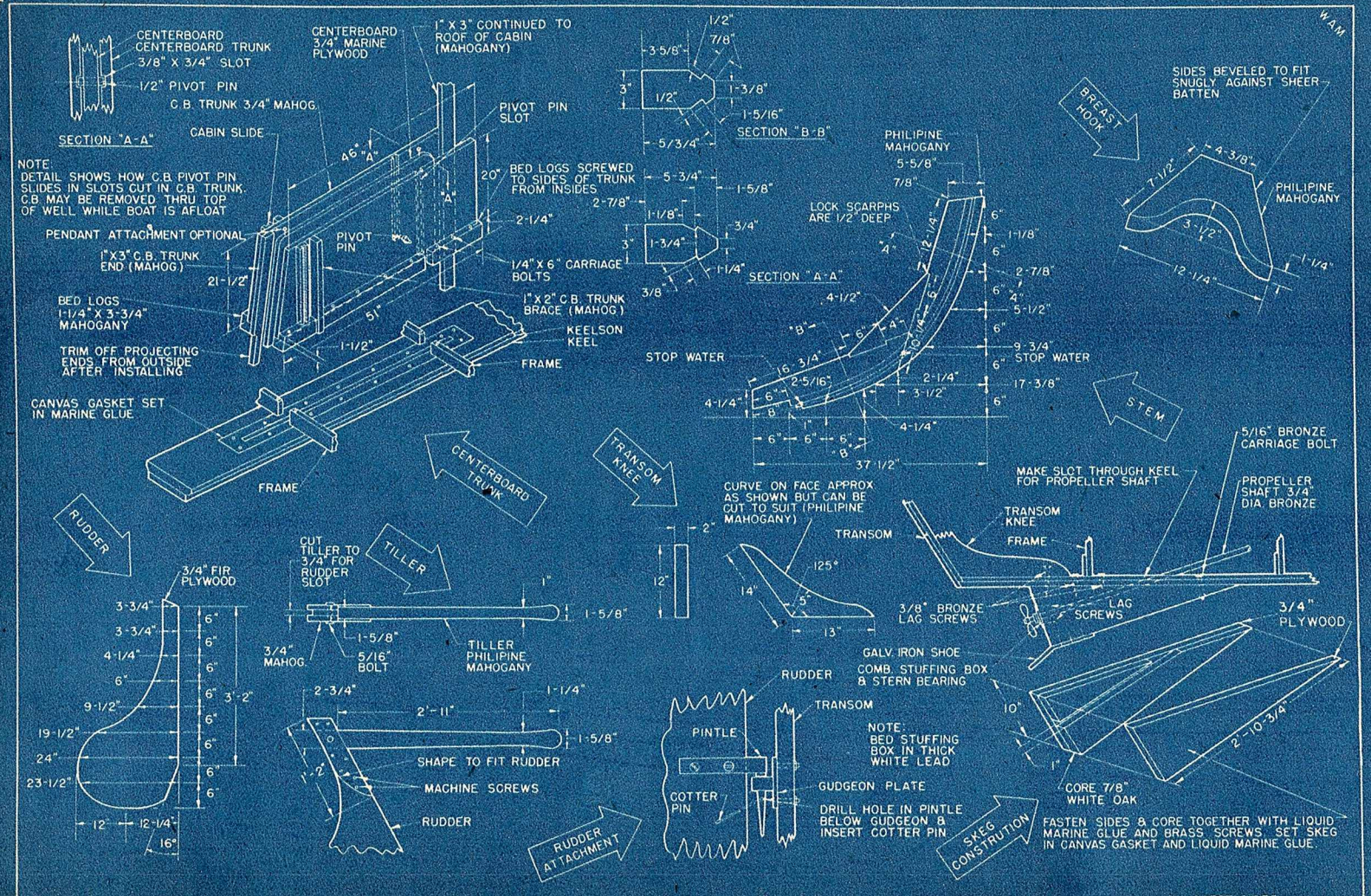
With the boat upright, installing the centerboard trunk is the next step. Cut off the frames and crosspieces extending above the sheer at stations 3 and 4. Then cut away the frames and floor beams on each side of the centerboard slot to accommodate the width of the completed trunk. Next the trunk is completed as shown in the drawing. Be careful in shaping the bottom as it must fit flush on the keelson to be watertight. Also be sure to paint the inside of the trunk with four coats of bottom paint before it is assembled. Use 1½-in. No. 10 screws to fasten the bed logs to the sides, driving them from plywood through mahogany. Then locate and bore holes though keel, keelson, and bed logs for the hold-down carriage bolts. Cut a gasket to fit over the slot and set it in a liberal quantity of marine glue. Put the trunk sides in position and ram down the end pieces. The forward post must stick up well above the top of the trunk so it can be tied into the cabin roof. Fasten the end pieces in place from both sides of the trunk, using 1¼-in. No. 10 screws. Run the bed log bolts up through from the outside and tighten with nuts and washers from the inside until the glue oozes out. You may now install the centerboard itself or leave it until later.

You are now ready to add the decking. Cut off the remaining projecting frames at the sheer and plane down any edges until they are flush with the sheer. The ⅜-in. plywood deck beam gussets are now cut. At frames 1, 2, 5, and 6 they can be triangular in shape, extending about 8 inches down the frame sides and 8 inches along the deck beams. Frames 3 and 4 show inside the cabin so you'll want to cut their edges with a graceful curve. Clamp the gussets to the frame tops and fasten with 1½-in. No. 10 screws. The three full-length deck beams and the short side ones are all cut from a 12-ft. plank as shown in the drawing. The beams are clamped one by one to the gussets, with their outer end butting against the frames, then screwed in place.

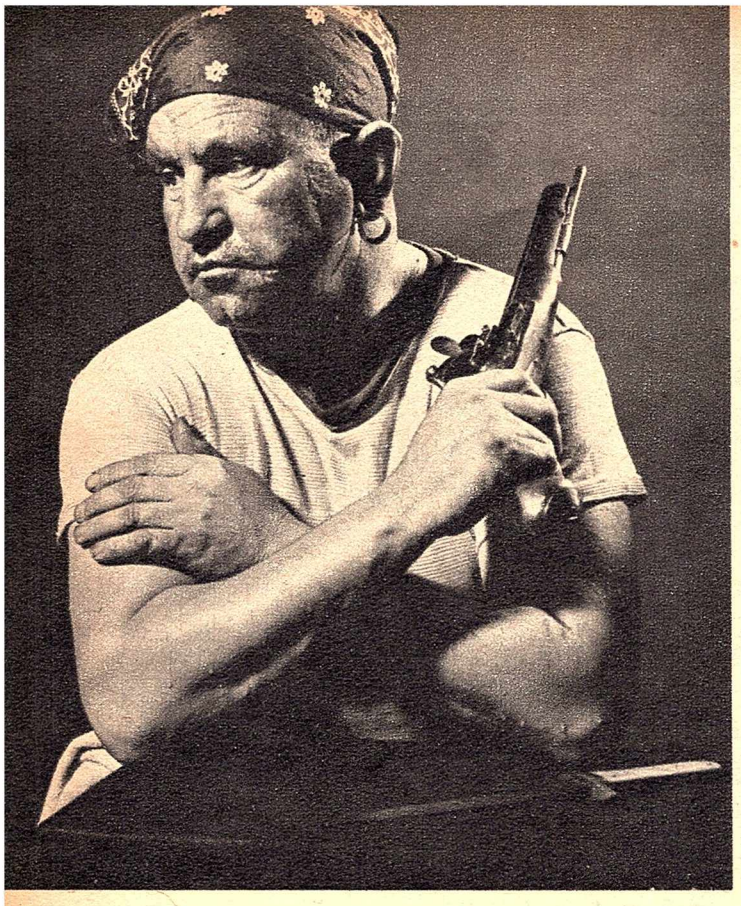
Next, bend in the two longitudinals that form the main fore and aft supporting members of the deck and cabin. Notch them into the deck beams and transom frame. They run continuous from station 1 to the transom and are fastened at each deck beam with one screw. Two other longitudinals are run under the fore deck on each side of what will be the hatch. These are notched into the breast hook and frames 1 and 2. The short side beams are notched into the main longitudinal and fastened with one screw at each joint.

The mast pardner, not shown in the drawing, fits just aft of frame No. 2. It is a 3x3x8-in. block of mahogany. An opening, 3½x4½ inches, is cut out of the center to take the mast, allowing ample room for wedging when the mast is stepped. A small hatch opening is provided just forward of frame No. 1. Three sides are already formed and it is necessary only to fasten a crosspiece to provide the fourth. Place an upright brace under the center of the deck beam at frame No. 6, securing with screws to the floor beam.

The covering is comprised of six sections: two forward, one on each side and two aft. Three panels of ⅜-in. plywood are used. To avoid waste, make paper patterns of the deck section before cutting the plywood. The plywood goes on quite easily and is fastened with 1-in. No. 8 flathead brass screws spaced about six inches apart. Butt blocks are placed under the side deck joints and ¾-in. plywood filler pieces back up the joint in the fore deck. The same arrangement is used [*Continued on page* 168]


CENTERBOARD TRUNK
3/8" X 3/4" SLOT
1/2" PIVOT PIN
C.B. TRUNK 3/4" MAHOG.
CENTERBOARD 3/4" MARINE PLYWOOD
1" X 3" CONTINUED TO ROOF OF CABIN (MAHOGANY)
SECTION "A-A"
CABIN SLIDE
PIVOT PIN SLOT
46"
4"
20"
BED LOGS SCREWED TO SIDES OF TRUNK FROM INSIDES
2-1/4"
NOTE:
DETAIL SHOWS HOW C.B. PIVOT PIN SLIDES IN SLOTS CUT IN C.B. TRUNK. C.B. MAY BE REMOVED THRU TOP OF WELL WHILE BOAT IS AFLOAT
PENDANT ATTACHMENT OPTIONAL
PIVOT PIN
1"X3" C.B. TRUNK END (MAHOG.)
21-1/2"
1/4" X 6" CARRIAGE BOLTS
BED LOGS 1-1/4" X 3-3/4" MAHOGANY
1"X2" C.B. TRUNK BRACE (MAHOG.)
51"
KEELSON
1-1/2"
TRIM OFF PROJECTING ENDS FROM OUTSIDE AFTER INSTALLING
FRAME
CANVAS GASKET SET IN MARINE GLUE
FRAME
1/2"
7/8"
3-5/8"
3"
1/2"
1-3/8"
1-5/16"
SECTION "B-B"
5/3/4"
5-3/4"
1-5/8"
2-7/8"
1-1/8"
3/4"
3"
1-3/4"
1-1/4"
3/8
SECTION "A-A"
PHILIPINE MAHOGANY
5-5/8"
7/8"
LOCK SCARPHS ARE 1/2 DEEP
4"
12-1/4"
6"
1-1/8"
6"
2-7/8"
6"
4"
4-1/2"
5-1/2"
"B"
6"
4"
6"
9-3/4"
STOP WATER
6"
STOP WATER
16-3/4"
2-5/16"
17-3/8"
4-1/4"
6"
2-1/4"
3-1/2"
6"
8
1"
4-1/4"
6"
6"
6"
8"
37-1/2"
W.A.M.
SIDES BEVELED TO FIT SNUGLY AGAINST SHEER BATTEN
BREAST HOOK
4-3/8"
7-1/2"
PHILIPINE MAHOGANY
3-1/2"
1-1/4"
12-1/4"
STEM
5/16" BRONZE CARRIAGE BOLT
MAKE SLOT THROUGH KEEL FOR PROPELLER SHAFT
PROPELLER SHAFT 3/4" DIA. BRONZE
TRANSOM KNEE
FRAME
TRANSOM
3/8" BRONZE LAG SCREWS
LAG SCREWS
3/4" PLYWOOD
GALV. IRON SHOE
COMB. STUFFING BOX & STERN BEARING
RUDDER
TRANSOM
NOTE:
BED STUFFING BOX IN THICK WHITE LEAD
PINTLE
GUDGEON PLATE
COTTER PIN
DRILL HOLE IN PINTLE BELOW GUDGEON & INSERT COTTER PIN
10"
2-10-3/4"
1"
CORE 7/8" WHITE OAK
FASTEN SIDES & CORE TOGETHER WITH LIQUID MARINE GLUE AND BRASS SCREWS. SET SKEG IN CANVAS GASKET AND LIQUID MARINE GLUE.
SKEG CONSTRUCTION
RUDDER
3/4" FIR PLYWOOD
3-3/4"
3-3/4"
4-1/4"
6"
9-1/2"
19-1/2"
24"
23-1/2"
6"
6"
6"
6"
6"
6"
3'-2"
12"
12-1/4"
16"
CENTERBOARD TRUNK
TRANSOM KNEE
CUT TILLER TO 3/4" FOR RUDDER SLOT
TILLER
1"
1-5/8"
3/4" MAHOG.
5/16" BOLT
TILLER PHILIPINE MAHOGANY
2"
12"
CURVE ON FACE APPROX AS SHOWN BUT CAN BE CUT TO SUIT (PHILIPINE MAHOGANY)
14"
5"
125°
13"
2-3/4"
2'-11"
1-1/4"
1-5/8"
SHAPE TO FIT RUDDER
MACHINE SCREWS
RUDDER
RUDDER ATTACHMENT
PINTLE
COTTER PIN

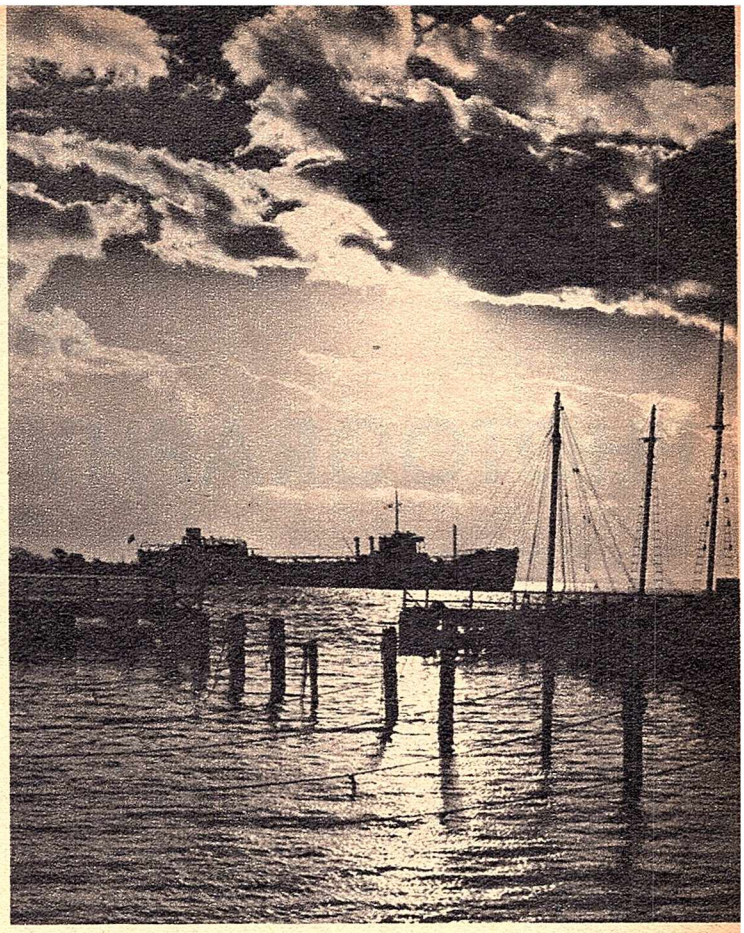
SHEET 5 OF 5



1st Prize ($25) .....Pirate
Marge Baldwin, Trenton, N. J., used a Ciroflex Model C camera, Super XX film, f-8 at 1/25, for this winning photograph.

$10 Award .....Homewards
Rollei, Agfa Isopan SS film, f-8, 1/50 sec., yellow filter. By B. Bhansali, Bombay, India.

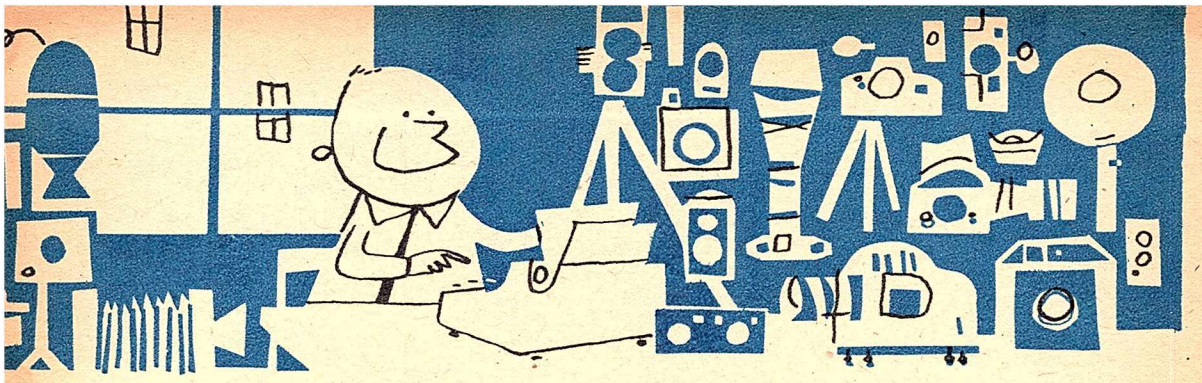
MONTHLY PHOTO CONTEST



$10 Award .....Evening Sun
Taken by Stanley Wasylik, South River, N. J., with 4x5 Graphic, 1/50 sec. at f-11.

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Please address your entries to: Photo Contest, *Mechanix Illustrated*, 67 W. 44th St., N.Y.C. 36

$10 Award .....The Last Flight
A Kodak Brownie box camera was used by John Vergis, Tempe, Ariz., for this shot.

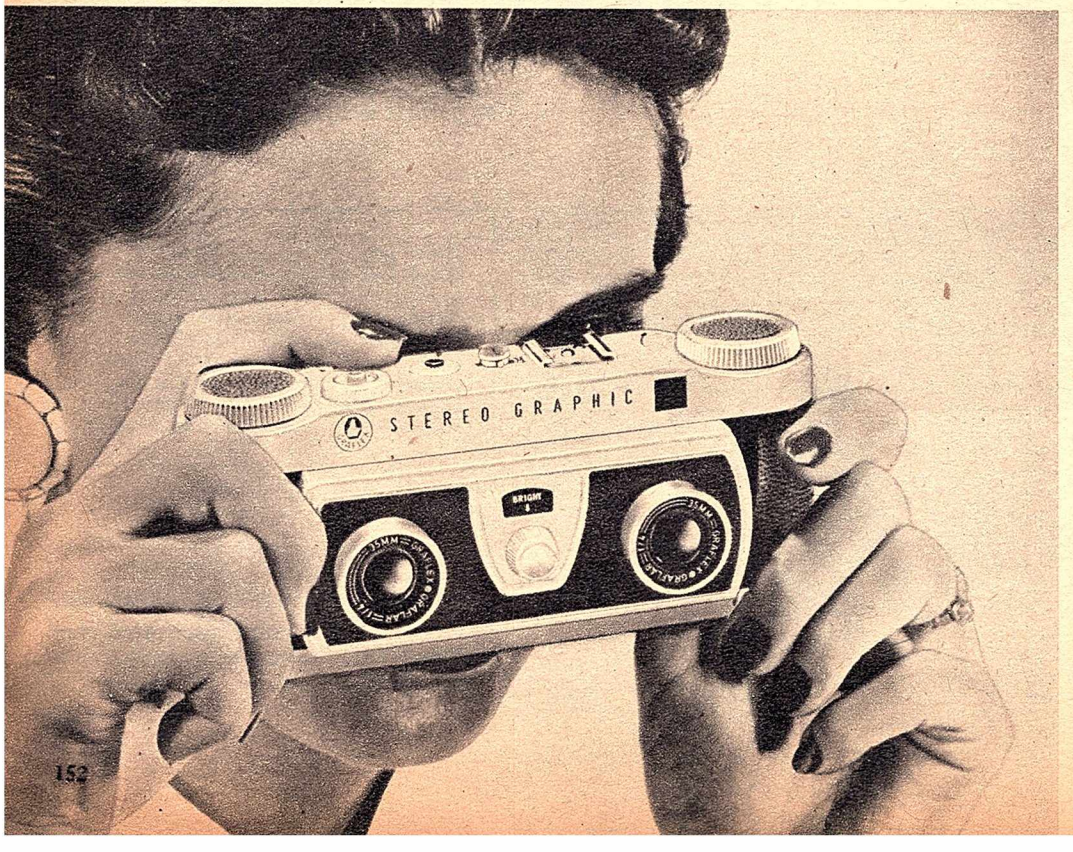


PHOTOGRAPHY TODAY

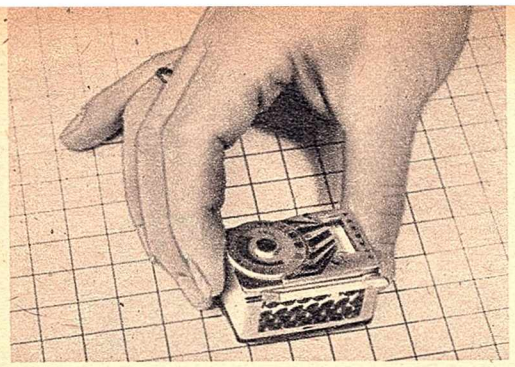
- *The Stereo Graphic*
- *The Sekonic Miniature Meter*
- *The Kodak Retina, IIIc*

THE newest stereo camera to hit the market is so simple to operate that even an inexperienced novice can make good shots with it. Two "variables" that cause beginners trouble have been eliminated on the Stereo Graphic.

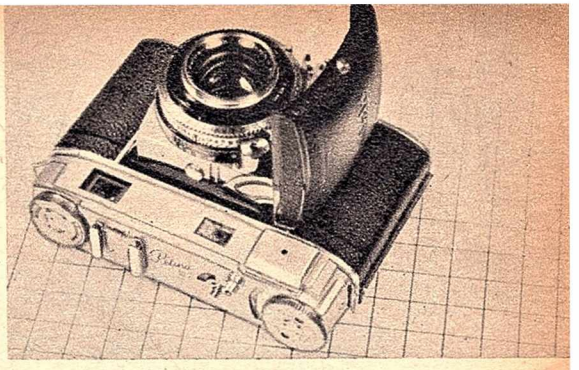
One, you don't have to focus this camera—the lenses are fixed so that everything from about five feet to infinity *appears* to be sharp. With the need to focus eliminated, the novice using the Stereo Graphic will get a



New stereo camera has lenses of unequal focal length to produce sharper pictures.



Sekonic miniature exposure meter is designed to fit shoe of all 35mm cameras.



Eastman's newest baby, Retina IIIc has built-in nearly everything, except a tripod.

larger percentage of sharp pictures than he would with a variable focus camera. The camera uses a unique two-lens optical system. At widest aperture, one lens in the system is in focus from the foreground to approximately 30 feet, while the other lens is positioned for objects from approximately 15 feet to infinity.

Two, there are just two shutter settings, I and B. The I, for instantaneous shots is fixed at 1/50th of a second, which is adequate for the average snapshot. In test shots made of moving children and animals some movement was noticeable but not enough to be objectionable.

With the need to focus and adjust shutter speed eliminated this leaves just one variable for the beginner to cope with—the diaphragm. And even here, the manufacturer tries to make it easy for the beginner—if Kodachrome is used. Here's why. On the indicator showing the "f" stop, various weather conditions are marked. Cloudy and f-4 are combined; hazy and f-5.6; bright and f-8; brilliant and f-11, and f-16 the smallest opening, has no weather condition marked on it. Evidently Graflex made a survey and found Kodachrome to be the most widely used type of color film.

But what if you're using the new, fast Ektachrome or Anscochrome. Or how about flash? Then you ignore the marked weather settings and just use the "f" numbers, following the exposure guide that is included with the camera.

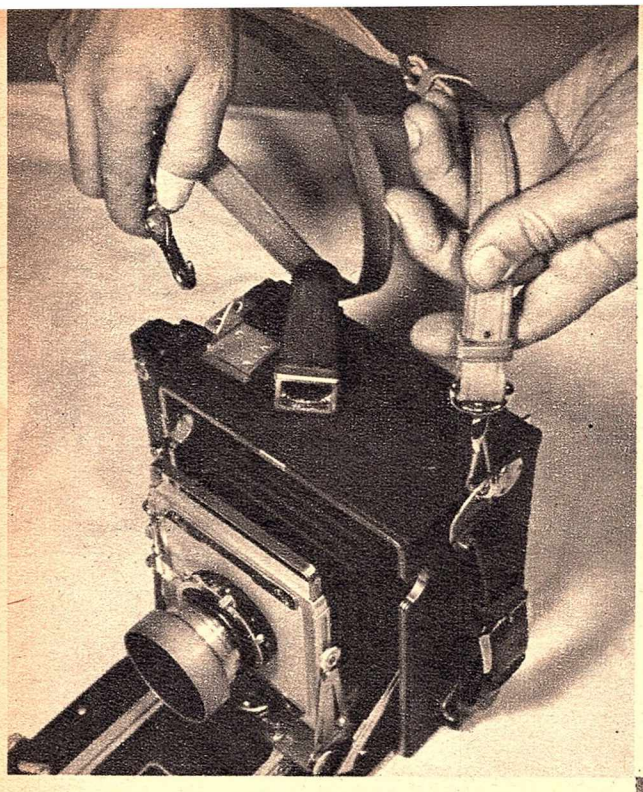
One side of the guide shows exposures for all popular color films when used outdoors and the other chart exposures for use with flash. In making tests the exposures given on the charts were followed to the letter and were found to be rather accurate. Most of the exposures were right on the nose, but a few were slightly over or under-exposed but still acceptable.

The diaphragm on the Stereo Graphic differs somewhat from those found on most cameras today. It does not have an iris that can be closed from the largest to the smallest opening in one continuous movement. Instead, it takes a page out of the oldtime photographers' notebook and uses Waterhouse stops. These are holes the exact size of a given opening punched in metal. On this camera they range from f-4 to f-16.

It is because of this particular type of diaphragm setting that the instruction booklet stresses several times, *Do Not Set the Exposure Dial Between Stops.* Should this be done the film would not be exposed when the shutter was released because a solid piece of metal would be between the lens and the film. Having Waterhouse stops makes the camera no less desirable just as long as the exposure dial is *not* set between stops.

Loading the camera is a simple operation. A single twist of the lock lever on the bottom of the camera enables you to lift the back off. The standard 35mm film cartridge is placed in position after the film is threaded onto the take-up spool, making sure both sprockets engage the film perforations. Then the back is again placed in position and locked. [*Continued on page* 184]

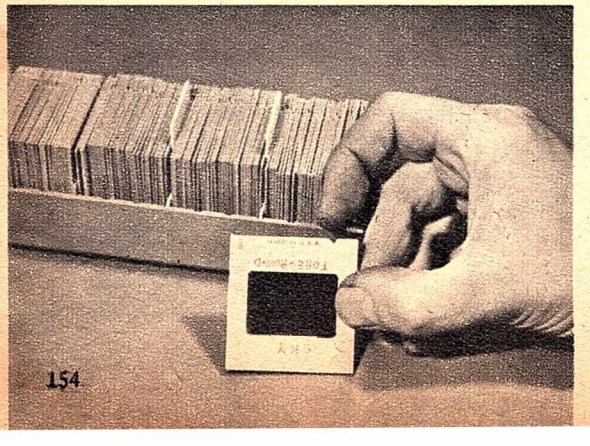
PHOTO WRINKLES



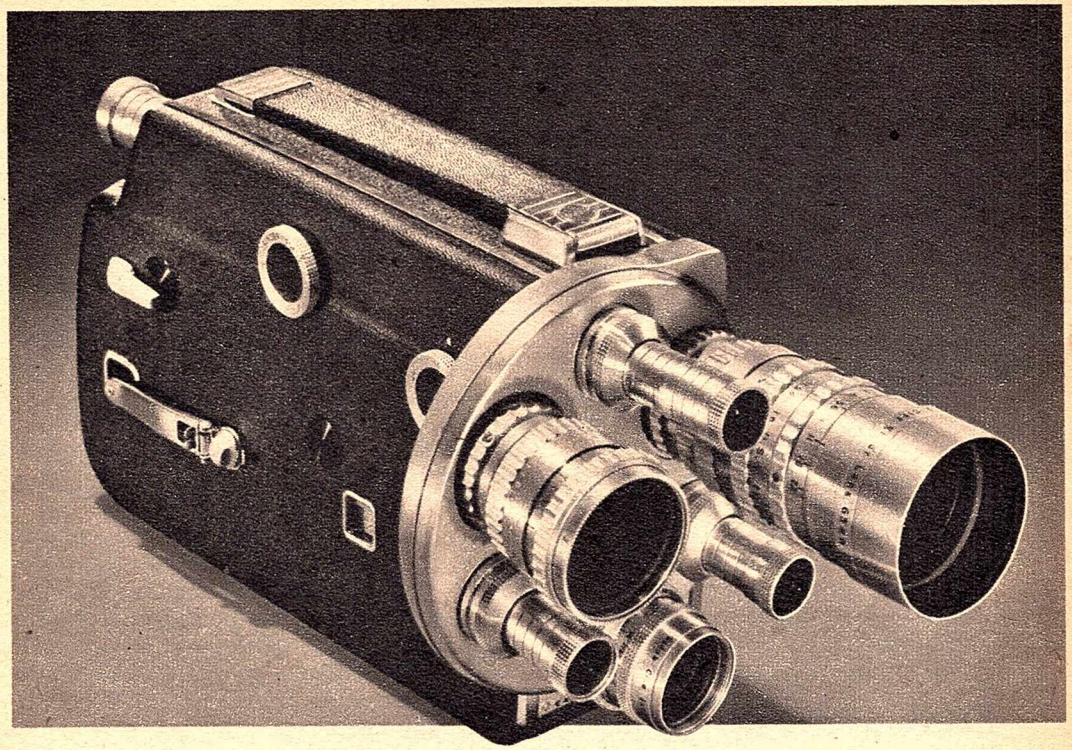
Press camera neck strap has swivel hooks attached, clips to aluminum or stainless steel brackets screwed to case as shown.

Right: a conical stone, mounted in a hand grinder, is used to grind permanent identification into a photo chemical bottle.

Stacking your slides is easy if you notch each in what will be the top right corner when properly positioned in the projector.



Enameled ferrotype plates can be cleaned with high grade automobile cleaner. Don't use an all-purpose type loaded with wax.



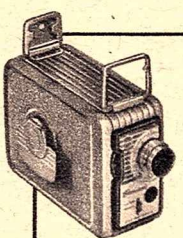
NOW IT'S HERE! THE MAGNIFICENT NEW

Cine-Kodak K-100 Turret Camera

Truly a 16mm camera built to perfection—not to price!

The K-100's turret accepts your choice of any three great Kodak Cine Ektar Lenses, 15 to 152mm, without optical interference. When you click the turret to shift from the standard lens to a wide-angle or telephoto lens, the matching viewfinder automatically clicks into correct position.

Luxury features? The K-100 is packed with them. Accepts single- or double-perforated roll film—gives you an unequaled 40-foot film run from *each winding* of its powerful spring-driven motor. Full speed range from single-frame exposures to slow motion . . . built-in exposure guide . . . precision footage meters to tell you exactly how much film can be exposed before rewinding, how much unexposed film remains on the roll. Provision for hand crank (for producing multiple exposures, dissolves, special effects), and for attaching electric-motor drive. K-100 Turret Camera with superb Ektar II 25mm Lens and matching viewfinder, from $315. See it soon!



Ask your dealer to show you the other 16mm and 8mm cameras in Kodak's famous family of movie-makers. Prices begin as low as $29.95!

Ask about small down payment, easy terms

Prices include Federal Tax and are subject to change without notice

Eastman Kodak Company, Rochester 4, N. Y.

Kodak
TRADE-MARK

Are You Driving A Dripper?

[*Continued from page* 141]

compound that can be applied to the cover.

Another troublesome area is around the automatic transmission or torque converter units where loss of oil has a very serious effect on the car's behavior. It costs real money these days to replace gaskets at such leak points only to have the fluid loss continue. And it is unnecessary as it is costly. So better remind your mechanic to apply gasket forming material to both sides of the torque converter gasket, as well as around any other parts where there's a chance of leakage.

We're using a lot of external lights on cars these days; this means more trouble from rain and dampness. Look around your car next chance you get and you'll see a number of such joints between sheet metal where a bit of suitable protection will pay real dividends.

If there is a punctured diaphragm in the vacuum booster of a dual-type fuel pump the windshield wipers will slow down when the engine is accelerated. But there will be three more clues. For one thing the engine will idle roughly because the mixture is being leaned out too much. With this will go greatly increased oil consumption. Finally, there will be some oil around the top of the fuel pump.

An old trick is to put newspapers under the car when garaging it for the night in order to have evidence of leakage, not only as to location but also as to quantity. But we must be prepared to be fooled a bit as to exact source of the trouble. Oil coming down from the overhead valve compartment may be sprayed by the fan to some other unit of the engine. Or, the oil will find a devious path down to the ground over a dirty, greasy engine block. Keeping the engine clean certainly helps when coping with the leakage problem.

Just for the record, remember that much leakage is caused by over-tightening. If you pull down the valve cover nuts too much the cover will buckle, and no amount of fussing with the gasket will help the situation. Oil that leaks into the distributor housing usually indicates that the crankcase vents are clogged. Pressure builds up within the case to a point where oil is forced out through any possible avenue of escape. One of these is around a slightly worn distributor shaft. Another is out of the oil filler pipe itself; the pipe is only pressed into the crankcase and can be withdrawn for cleaning.

Leakage in the hydraulic braking system is a story in itself, but the main points to watch are the individual wheel cylinders as well as the master cylinder. Scored cylinders and worn or rotted rubber cups are certain to start trouble. When inspecting the wheel cylinders externally always pull back the rubber protective covers; this will often reveal a small leak that will later turn into a humdinger.

When there is a spongy feeling to the brake pedal, or it goes down to the floor, there's a good chance of air being in the braking system. It can be due to incorrect adjustment of the piston rod which connects with the brake pedal. Interior fluid is a common cause of brake trouble leading eventually to leakage.

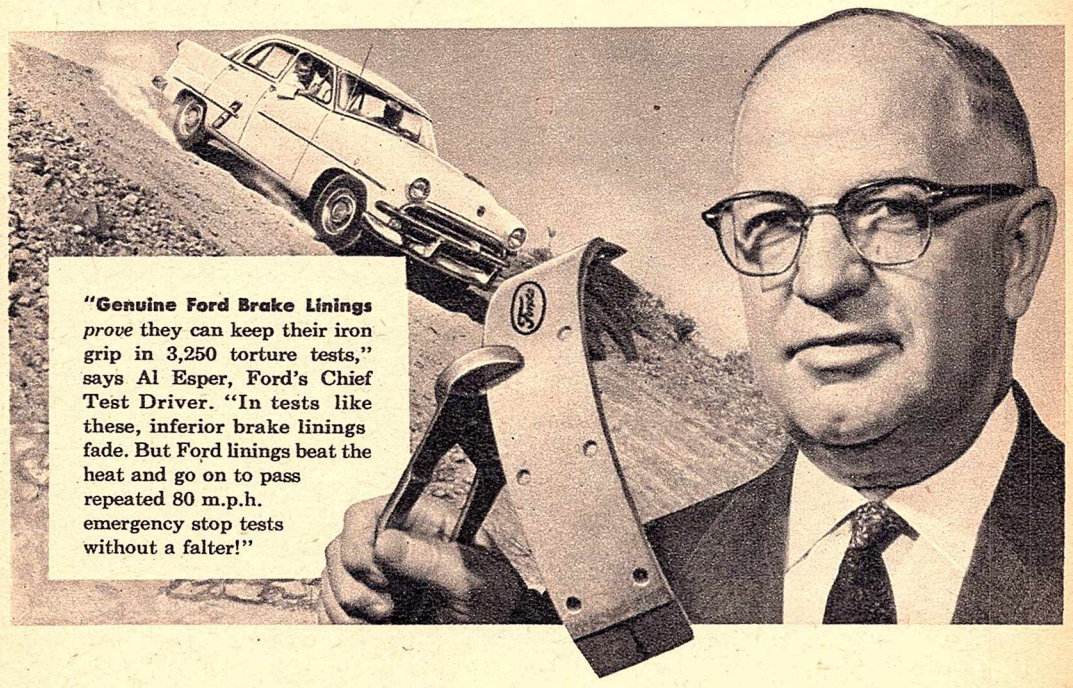
Here's a handy test for master cylinder leakage: press lightly on the brake pedal. If the pedal goes to the floor slowly, look for trouble in the master cylinder's valves, or for a leak past its primary cup. Don't press hard on the pedal because the effect of this will be to seal the valves as well as the cup. It's a tip-off to pump on the pedal hard if there's ever any hint that the brakes are not holding. Brake failure because of no fluid left in the reservoir is the penalty for not paying attention to warnings of fluid leakage.

There should be a vent in the rear axle housing to relieve pressure and thus to help prevent lube from leaking into the rear brakes. Where there is an enclosed propeller shaft it is important to prevent lube from leaking from the transmission and running down the torque tube to overfill the rear axle housing. Watch for that well-known leakage past the rear main motor bearing and its retainer into the clutch housing. Lube can also work into the clutch from the transmission.

But with that drain on your pocketbook as a reminder of the need for action let's hope a little plugging with these facts about leakage will save you some of those hard-earned dollars. •

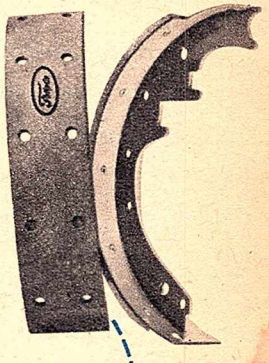
For your Ford – always specify the brake linings with the

IRON GRIP



"Genuine Ford Brake Linings *prove* they can keep their iron grip in 3,250 torture tests," says Al Esper, Ford's Chief Test Driver. "In tests like these, inferior brake linings fade. But Ford linings beat the heat and go on to pass repeated 80 m.p.h. emergency stop tests without a falter!"

Like these brake linings, all Genuine Ford Parts must pass severe torture tests



When a replacement will add to your Ford's performance—such as water pumps, shock absorbers, distributor points—make sure it's a Genuine Ford Part.

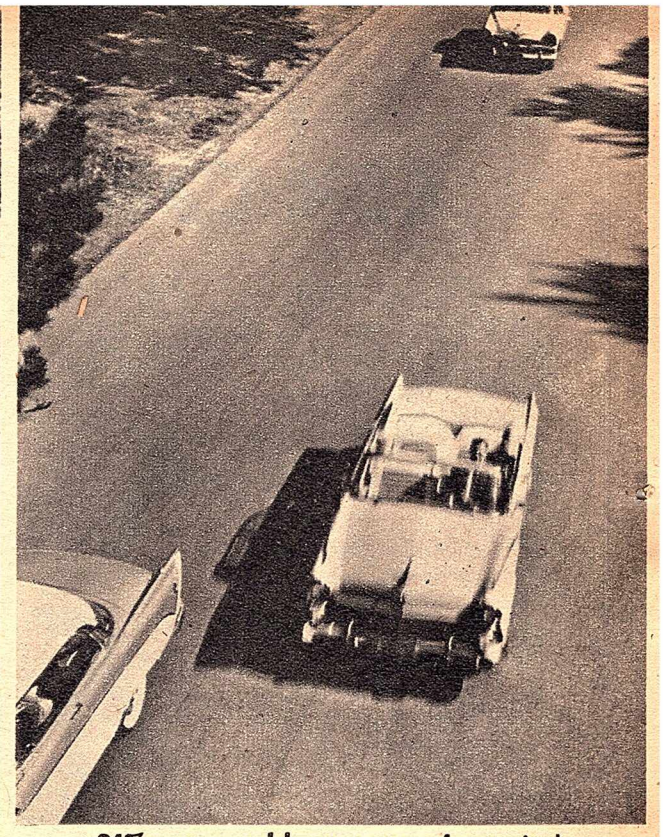
It will help your car run "like new" because it's built to the specifications set when your car was brand new. You can count on long, dependable service, too, for all Genuine Ford Parts must pass grueling endurance tests before they are accepted for manufacture.

That's why you should always specify Genuine Ford Parts. They're *made right to fit right to last longer in your Ford.*

May is National Safety Month—be sure you can see, steer, stop safely!

Keep your Ford all Ford

24% more road horsepower—for hill climb!



24% more road horsepower—for passing!

Champion introduces a great new spark plug

Tests prove new Champions give big power boost to cars that have gone about 10,000 miles without a spark plug change. If you haven't changed your plugs recently, put in new Champions—and feel the difference immediately!

You just can't imagine what a difference new 5-rib Champions can make in your car's actual road horsepower.

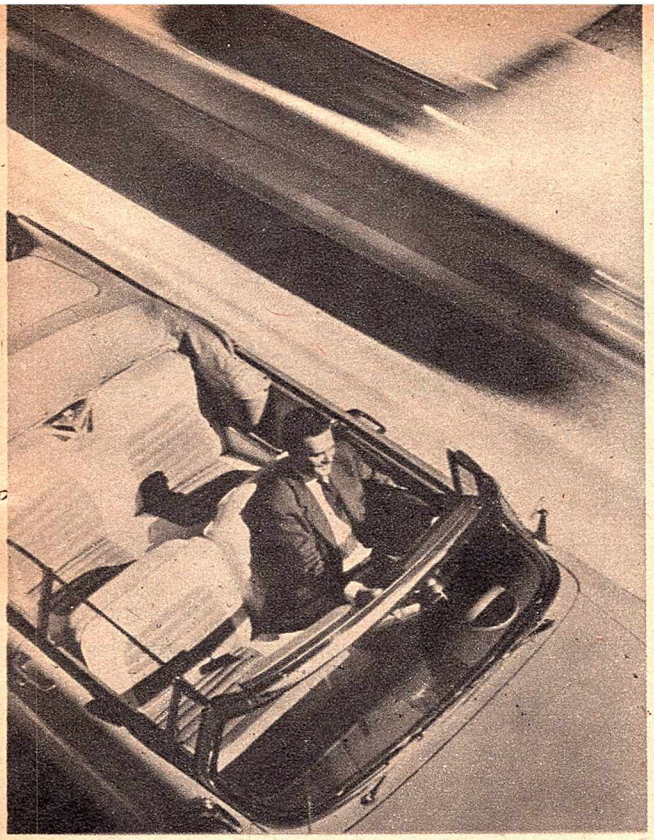
But this difference has been proved—without a shadow of a doubt—in tests conducted by one of the country's largest independent research centers. Regular passenger cars whose plugs had gone roughly 10,000 miles were tested first with their regular plugs; then with new Champions.

Nothing about these cars was changed except their spark plugs. Yet there was an immediate increase in their road horsepower—the real power actually delivered at the rear wheels!

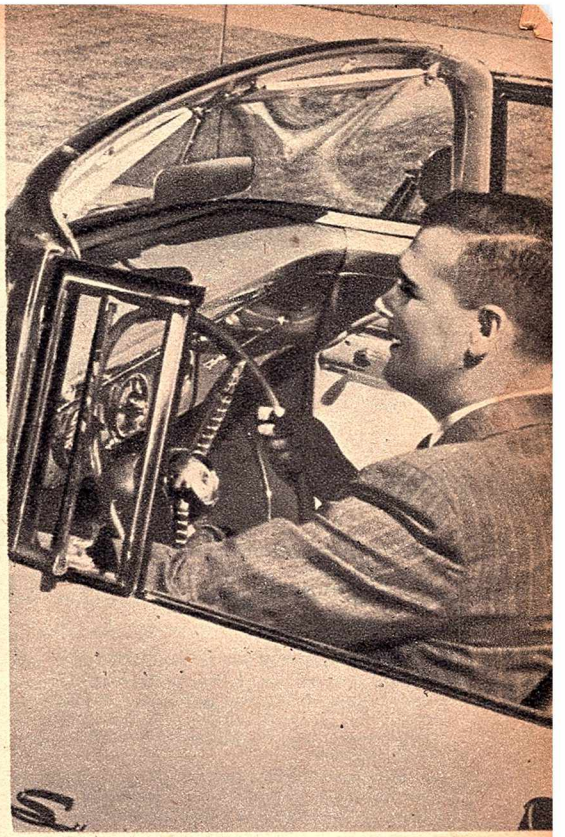
Some of the results were spectacular. For example, a 1955 six-cylinder car whose plugs had gone 10,000 miles actually showed a gain of 72.5% in road horsepower! A 1954 V-8, whose plugs had gone 12,000 miles, got a boost of 53.5%. Some cars, of course, showed smaller gains; 20% in the case of one 1955 V-8 and only 6.5% (the smallest gain) in another. *But the average road horsepower gain for all cars tested was a fraction over 24%!*

And what a difference these new plugs can make in your car's starting! Tests show Champions reduced starting time by as much as 71%—with an average of 39% for all cars tested!

If you haven't changed plugs recently, it's high time to install new Champions. Whatever your car, these great new plugs give you more actual road horsepower—*immediately!*



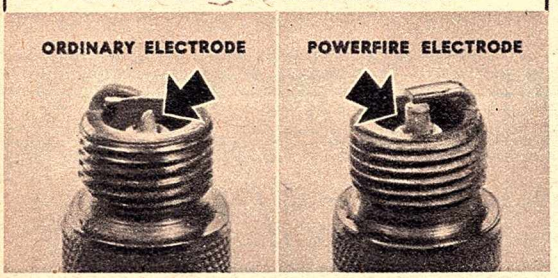
24% more road horsepower—for the straightaway!



Quicker starts, too—39% quicker!

-it can increase road horsepower by 24%!

SEE HOW MUCH BETTER AND LONGER NEW CHAMPIONS STAND UP IN TODAY'S HIGH-POWER ENGINES



New Powerfire electrode makes the difference! Both of these spark plugs have been subjected to identical use in a modern high-compression engine. You can see the old style electrode **(left)** is badly pitted and burned away. Plugs like that in your car often misfire . . . waste power and gas. Champion's new Powerfire electrode **(right)** is still able to give many more miles of powerful, economical performance.

now! assemble your own

ALUMINUM SCREENS

save up to **50%**

LIFETIME PROTECTION—
YET IT'S ONLY *MINUTES* FROM PARTS TO FINISH WITH

HOMESHIELD®

easy-to-make SCREEN KITS

Make your work shop pay off! Assemble these maintenance-free aluminum window screens for your home, cabin, or shop and save money...make 'em for neighbors, apartment houses or businesses, and make money! It's a simple assembly job that requires no special tools.

No more repairing or repainting! Replace heavy, old-type screens or screen your new home with sparkling Homeshield screens that'll dress up your home for life.

Eliminates rust and stained walls. Lightweight—install or remove in a jiffy. No ladders needed.

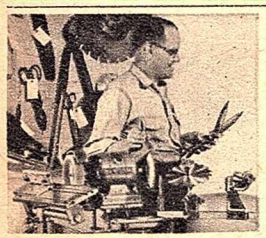
Kits are complete with sturdy aluminum frames, easy-to-handle Fiberglas® screening, corner locks, installation hardware — even a miter box. Sizes for full screens and sliding half screens (and storm sash, too!) Ask your department store, hardware or lumber yard dealer, or mail coupon for folder and name of nearest Homeshield distributor.

AMERICAN SCREEN PRODUCTS CO.
Dept. MIK-6, 807 N.W. 20th Street, Miami, Florida

Name.....

Street.....

City..... State.....



Make $5.00 an Hour CASH PROFIT
The Day You Start!

Start Your Own Business at Home... Sharpen Household, Garden and Shop Tools in Spare Time

Turn your spare time into Big Cash Profits with the new Belsaw Sharp-All. No experience needed to sharpen knives, scissors, shears, ice skates, mower blades, hedge trimmers, axes, chisels and circular saws... just about any household, garden and shop tool. Your own CASH business. No inventory... no calls to make.

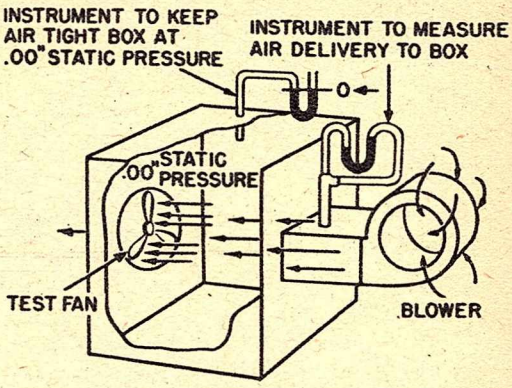
Learn how easily you can start your own spare time business. Amazing low cost easy-payment plan. Send postcard for

FREE BOOK

BELSAW SHARP-ALL CO., 7186 Field Bldg., Kansas City 11, Mo.

Cooling For Your Home

[*Continued from page* 113]


INSTRUMENT TO KEEP AIR TIGHT BOX AT .00" STATIC PRESSURE
INSTRUMENT TO MEASURE AIR DELIVERY TO BOX
.00" STATIC PRESSURE
TEST FAN
BLOWER

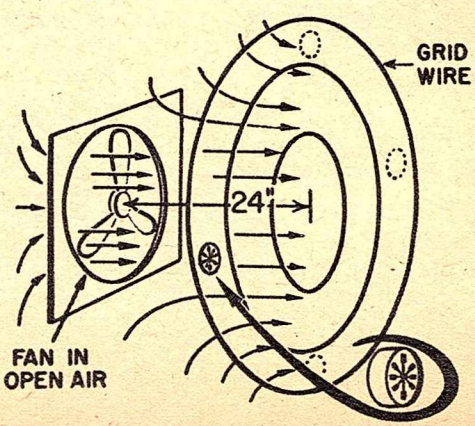
Drawing shows test set-up used by NAFM.

cost less than the central systems but if properly installed and used, will do just as good a job for one room as the big units do for the whole house.

As is the case with attic fans, there are a number of alternate installations possible. For the most efficient operation, the fan inlet should be located as close to the kitchen range as possible so that grease-laden vapors can be trapped before they have a chance to spread. In addition the inlet should be so placed that fresh air will sweep across the entire kitchen. An open window next to the inlet opening will cut down on the fan's air handling capacity. Apart from these two general considerations, any installation method will do that fits the architecture of the house and the disposition of the owner.

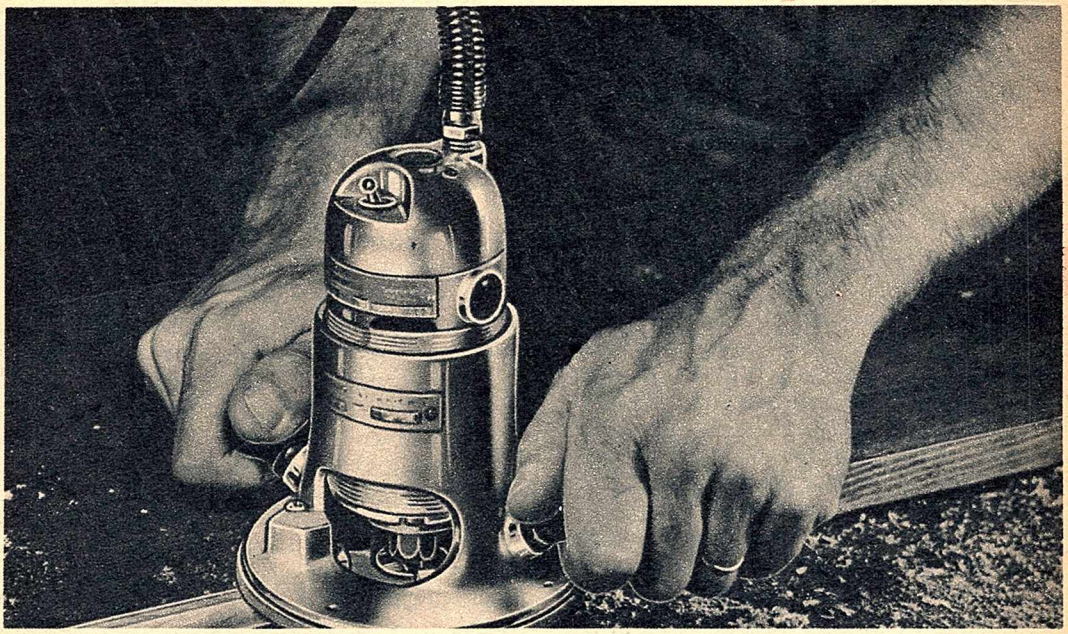
Since there are two general types of kitchen vent fans, wall mounting and ceiling mounting, almost any kitchen

[*Continued on page* 179]



NEMA test set-up. Note fan in open air.

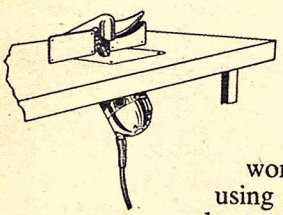
Look! Router At Work



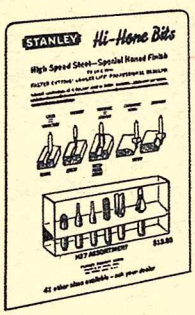
Those of you who have never used a router need only see one at work to be fascinated . . . need only try one to want it for your own shop.

The router shown here, cutting a decorative edge, is Stanley's No. H15. Its ¼ hp Stanley-built motor powers a wide variety of bits at a smooth cutting 27,000 rpm. For heavier duty we recommend the ½ hp Stanley H45 Router.

Look Again! It's A Shaper



Now it's a shaper! The Stanley Router converts to a useful shaper when mounted on your work bench as above, using the special shaper adapter kit. Same router motor powers shaper. With H15 Router use Kit H127 . . . Kit H26 if you have H45.



You'll want a variety of bits for your router. This H27 Assortment of "Hi-Hone" bits gives you 6 of the most popular. Your dealer has a full selection of Stanley bits and cutters for router and shaper. Start with the H27 pack and add as you need.

Stanley Routers are on display at your favorite hardware store or building supply dealer's. Ask for a demonstration. For further details send for Catalog 400. Write Stanley Electric Tools, 966 Myrtle St., New Britain, Connecticut.

STANLEY

[*Continued from page* 136]

(ours is 9x5x6), and cut and drill all the holes for the meter and controls. Also, cut and shape a metal shelf to hold the tubes and wiring for the counter circuit. This is attached to the front panel and held there by the nuts that also hold the on-off switch and bias control, and is installed so that the shelf is just under the meter. The tubes are mounted toward the rear of the shelf leaving enough room for the meter depth.

The HV vibrator supply and the four flashlight batteries are mounted below, and the 67½-volt battery and the 6-volt bias battery are mounted on a second shelf in the cabinet about one inch below the shelf mounted on the front panel. This will allow a certain amount of shielding from the vibrator below. Battery holders should be used for the flashlight cells and the bias cell so that in changing you just remove the old and snap in a new one. If you solder them, it will be hard to replace them in the field since you will also have to solder in new ones when replacing. The cabinet has the top as well as the bottom removable.

Having installed the shelves and controls (don't mount the meter yet as it may be damaged in knocking around the panel while you wire it up), proceed to wire up the counter circuit and tubes. Mount the detector connecting cable jack on the cabinet and then wire up the HV circuit. Install the battery holders and vibrator in the bottom part of the cabinet, mounting all the components on terminal lugs. Wire up the meter circuit, this is done by mounting a terminal board with five terminal lugs directly on the meter, using the meter connecting screws to hold the terminal board to it. Also mount the transistors and other components on this board. The zero pot and range switch are mounted on the front panel. The terminal board should be cut small enough to fit through the hole that has been cut for the meter so that if you wish to check this circuit you may remove the meter together with the terminal board and all the components.

After completing these circuits, test them to be sure they are working properly. This is done by connecting the necessary batteries and adjusting the zero pot for a mid-scale reading on the meter. Next, adjust the bias control RC1 for maximum negative bias on the grid of the V2, thus causing the counter to stop oscillating, and readjust the zero pot so it reads a little more than zero. Also check to be sure that you can swing the needle through zero with the zero pot. Now, adjust the bias pot slowly until the meter reads full, and slowly adjust it back to the exact point where the meter jumps back to a near zero reading. If it only jumps back to a half-scale reading use the zero pot to bring the needle down a little more to a near zero reading. Don't try to bring the needle down to zero with the bias control as this will reduce the sensitivity. The correct setting of this control is the point where the needle just jumps back to a low reading, after which it should not be moved except when required by the weakness of the batteries.

After setting up, test the set by touching the finger to the input condenser lead. This should cause the meter to read since the body always has a small AC charge which is enough in this case to start the set working. If a square wave generator is available you can further check the instrument for sensitivity and calibration as follows. Set up the counter as explained above and feed into a signal of about 30 cycles. This should cause the meter to read about full on the No. 1 position of the range switch. Now, turn the generator output down. The meter should now return to zero. If it doesn't, try removing the generator output lead from the counter circuit and note if the meter now returns to zero. Some generators cannot be turned down completely and there is always a small signal across the output cable, which in some cases is enough to start the counter and cause the meter to read. Now, with the generator connected and the meter showing a reading, adjust the signal generator to give a full reading on the meter by varying the frequency; varying the signal generator output control should not have any effect on the meter reading. After adjusting the signal generator frequency to the exact point that gives a full scale reading turn the range switch to the next higher counting range and

check it in the same manner, noting at what frequency you get a full reading. The frequency is equivalent to counts per second, which can be converted to counts per minute by multiplying by sixty. The circuit has been designed to read full at approximately 2,000 cpm on the first range, 10,000 cpm on the second range, 50,000 on the third, 500,000 on the fourth, and about 2,000,000 on the last. Most signal generators don't go up this high (33,000 cycles per second), but if it goes up to about 20,000, you should get about a ¾-scale reading on that.

Having completed that part of the instrument proceed to wire up the high voltage circuit according to the diagram and install it in the cabinet, checking to be sure that the cabinet will close properly.

The high voltage output cannot be accurately measured with ordinary test equipment, even a VTVM. The output current is so low that the test equipment will load it down and give a false reading. So you must take into account the resistance load the meter is placing on the circuit and figure the actual voltage. If you have a high voltage probe for your VTVM, you can use it and be reasonably sure that the voltage you read is correct, since the load resistance of these probes is very high. Lacking this equipment, another method may be used to check the high voltage and will be described later in the article.

Next, start building the probe unit. Having obtained a 6199 photo-multiplier tube, a socket to fit it (which is a standard picture tube socket, but with all twelve pin connections, and is known as a duodecal socket); a one-inch diameter by half-inch thick thallium activated sodium iodide crystal (a larger one of course will be better, but it costs much more); a ten-foot piece of shielded cable (three wires including the shielding); a piece of tubing about two inches in diameter and about ten inches long, made of any type of metal, but preferably of stainless steel. Also, a thin aluminum can to hold the sodium iodide crystal, cut and shaped as shown in the drawing, a tube of silicone grease, and a piece of emery cloth or sandpaper of about 200 grade or finer.

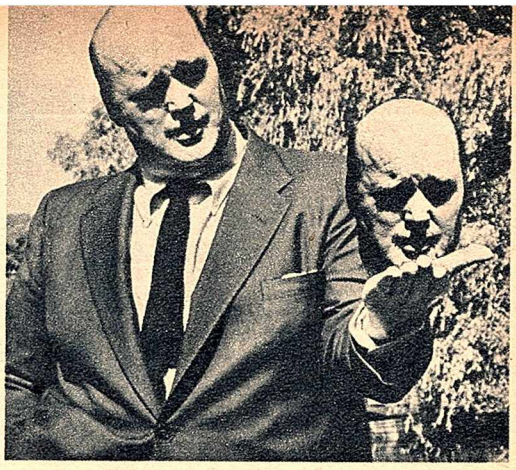
Wire up the socket as follows: first wire in the resistors starting with the 20 meg between pins one and twelve; then, each succeeding 10 meg resistor in its turn. You will find that they will lay nicely one next to the other right across the bottom of the socket. Next, wire in the condensers (220 mfd), and connect the cable; don't mount the jack at the other end yet. Shape the tubing by cutting slots all around one end, about ½ inch in and ½ inch apart. Now, bend these in, closing the end slightly and forming a shoulder. File out the hole that remains so that the aluminum crystal holder end will just fit in the hole. Glue a thin piece of sponge rubber around the inside of the hole; this will prevent damage by shock when the probe is in place inside. Now, make a cap for the other end of the tube. Cut a metal disk of aluminum or any other metal, about four inches in diameter. Draw a circle in the center of it to the size of the tube you are using. Make V cuts in as far as the circle you have drawn and bend the ends down around the tube so that it just fits over the tube.

Drill a ¼-inch hole in the center, for the cable to come through, and about four or five holes around the sides. Place it over the tube and drill holes in the tube to correspond with the holes in the cap. These holes should be smaller, to hold the cap on with self-tapping screws. Now, push the cable through the ¼-inch hole of the cap and make a knot in the cable about five inches from the socket end. This will limit the amount of cable that will pull through the hole so that when the instrument is completed the probe may be held by the cable without danger of tearing the connections loose from the socket. Mount the connecting plug at the other end of the cable.

We are now ready to work on the crystal. It is very important that this work be done in the exact order given. Clean off a table or bench with a flat surface to give yourself enough room to work freely. Place the emery cloth or sandpaper, sanding side up, and tack it down so that it will lay flat and will not move. Also, have near you on the table a roll of Scotch waterproof

[*Continued on page* 180]

MAIL FOR McCAHILL



Uncle Tom is sorry he can't answer all his mail personally. In this column he'll answer the most interesting letters. Write to him at MECHANIX ILLUSTRATED, 67 West 44 St., New York 36, N. Y.

● *Believe it or not, I have a 1934 Plymouth whose roof is infested with termites. Have you any suggestions?*

Larry Bolen, Jr.
Toledo, O.

Don't chase them out. They're probably the only thing holding the car together.

● *I recently read that when washing your car you should start at the bottom and work up. Sounds screwy to me. Do you agree?*

Bob Johnston
Miami Beach, Fla.

Sounds screwy to me.

● *Boy, were you lucky! I was at Speed Week this year and it didn't look like the beach would ever flatten out, and it didn't until the last minute. Why don't you have substitute plans for taking care of such things?*

George Richards
New Orleans, La.

We are now negotiating with the Portland Cement Company to dump 8,603,000 bags of their quick-drying cement on the course by helicopter, if it ever becomes rough again. This'll quickly be spread by dragsters and after the next tide we'll have the only paved beach in the United States.

● *I've been told that, through condensation, a cupful or more of water will get in a car's gasoline system and tank in about a year. What's the dope about this? I've also been told that a quart of alcohol in the gas tank will clean out the water. Is this true?*

Harry Barnard
Atlanta, Ga.

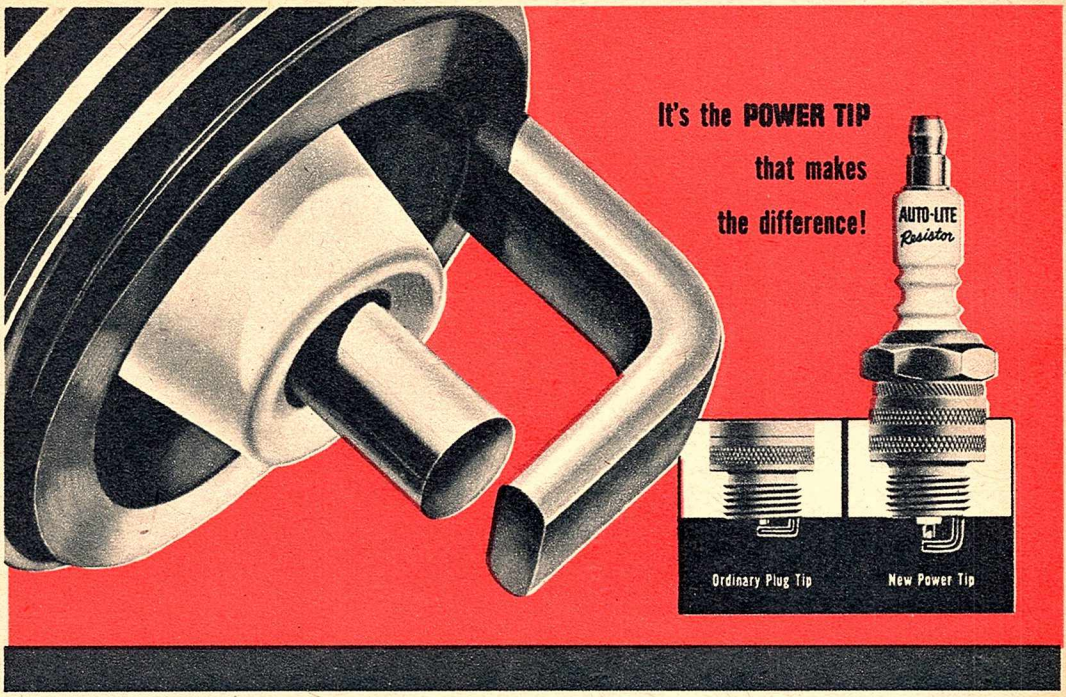
True on both counts. Most service stations sell alcohol products such as DriGas which will mix with the water. This mixture will then flow freely through the regular gas lines and carburetor jets and pass out of the system unnoticed. I dump a quart of alky in my fuel tanks about every six months on general principles. Incidentally, the surest way to avoid getting water in your tank through condensation is to keep it as full as possible at all times, especially when the car isn't being used. This doesn't, however, eliminate the water you get in fuel at service stations that have let their supply run too low in the tank. This is the most common way to get water in your gas.

● *We work in a Motor Pool as mechanics and are (my helper and I) continually arguing over cars, etc. We have a problem that we would like to settle once and for all. Is it all right to call an engine a motor? If not, why do they call this a Motor Pool? I also noticed in a mechanic book under "Tune-Up" they called it "Motor Tune-Up."*

Virgil W. Eckstein
Fort Bragg, N. C.

Any real old-timer would split your skull open with an axe for calling an automobile engine a motor. To them an engine was an engine and a motor was an electrical device that transferred electrical energy into mechanical energy. Through the years we have softened up on exactness of words and today motorboats, motor tune-ups, outboard motors are accepted as correct terminology. Webster's Collegiate Dictionary claims a motor is "any internal

[*Continued on page* 166]



Some spark plugs are designed for low speeds . . . some spark plugs are designed for high speeds . . .

Only new POWER TIP "fires up" your engine at all speeds!

No more need for old-type plugs in modern engines. In the past, you had no choice but to use conventional type spark plugs in your modern overhead-valve engine. You had to choose between "hot" or "cold" plugs depending on whether your driving was mostly at *low* speeds or *high* speeds.

Now new POWER TIP—one plug for ALL speeds! Here's the difference. Projecting center electrode and ceramic tip—the POWER TIP—extends the spark gap in toward the center of the combustion chamber. It operates *hotter* at low speed—resists fouling because deposits burn away clean. Yet the Power Tip takes advantage of richer intake gases in high-speed, wide-throttle driving—runs *cooler* and checks pre-ignition!

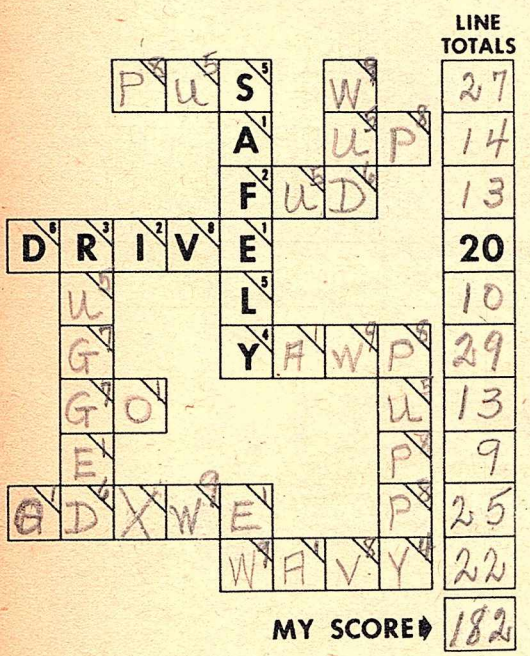
Available now for all these cars with overhead-valve V-8 engines using 14 mm plugs: Buick, Cadillac, Chevrolet, Chrysler, De Soto, Dodge, Plymouth, Ford, Hudson, Imperial, Lincoln, Mercury, Nash, Oldsmobile, Packard, Pontiac, Studebaker.

AUTO-LITE RESISTOR SPARK PLUG WITH POWER TIP

Auto-Lite manufactures over 400 products, including Spark Plugs, Batteries, Wire and Cable, and Automotive Electrical Systems . . . sold throughout the United States and Canada.

Highway Safety Contest Puzzle No. 1

Reprinted From The May Issue



LETTER VALUE CHART

A-1	F-2	J-7	N-2	R-3	V-8
B-4	G-7	K-10	O-1	S-5	W-9
C-3	H-3	L-5	P-8	T-2	X-5
D-6	I-2	M-6	Q-10	U-5	Y-4
E-1					Z-1

NAME.....

ADDRESS.....

CITY.....STATE.....

This copy of Puzzle No. 1 may be used in place of the original printed in May MI. Be sure to follow all the rules on pg. 80.

Mail For McCahill

[*Continued from page* 164]

combustion engine, esp. a gasoline engine, as for an automotive vehicle." If you called a glamor girl in Lincoln's time "terrific" her brother would shoot you right in the belly, if her father didn't beat him to it. Today the gal would kiss you. See what I mean?

● *I am a monthly fan of yours. I have never seen a report of yours on a Nash or Packard.*

Bernard Kantak
Syracuse, N. Y.

We tested the Nash Rambler in the February issue this year and the Packard in July '55. During the years we have run many Packard and Nash tests. When did you start becoming a monthly reader—this month?

● *I hear you disqualified a lot of Chevrolets at the Daytona Beach Speed Week for one thing or another. Bet this made Ford happy!*

Joe Darby
Indianapolis, Ind.

Not especially. The first car I disqualified during Speed Week was a Ford.

● *I bought a copy of May '55 MI at a cut-rate second-hand magazine shop and while browsing through it noticed a report on the Daytona Beach races. Much to my surprise it showed a lowly Thunderbird showing its tail to a pack of Jags and even three Mercedes-Benz 300SL's. Were the drivers of the 300's trying to make like handicapped snails or did the T'bird have JATO units? It seems to me that as an authority on sports cars you should have shown at least a slight bit of surprise at this upset.*

David Pease
Aberdeen, Wash.

I wasn't surprised; I owned the T'bird. Furthermore, you can always expect disappointments in second-hand magazines.

● *As an old booster of black-painted cars, I feel it's pretty disgusting to see so many new models featuring all-white. It makes them look like milk wagons, to*

use a McCahillism. How do you feel about this?

L. B. Burnett
Chicago, Ill.

As a former owner of several black cars, I am forced to admit that white or any light color shows dirt far less than its darker brethren. In addition, they are many degrees cooler in hot weather due to the reflective properties of white against the absorption qualities of black. About the McCahillism, why not just say they look like a guy who has just been overdrawn at a blood bank?

● *You may find this difficult to believe but when I took delivery on my new Plymouth recently I found a hockey puck in the glove compartment. I asked my dealer what it was for and he couldn't tell me. Can you?*

H. G. Schindler
New York, N. Y.

To play hockey with.

● *About a week ago, off Pumpkin Key, I was tied to a marker fishing when a blue boat named The Rooster slowed down nicely as it passed me. Only after it went on again did I get to thinking the guy driving the boat looked like Tom McCahill or his double. Was it you by any chance?*

Harry Chapin
Coral Gables, Fla.

Guilty.

● *Is Bill France any relation to Mendes?*

Kay Ransom
Richmond, Va.

Mendes is Bill's grandfather, once removed from Anatole.

● *For the past several years you've been the best. I mean it! Your honest and "pull-no-punches" articles about automobiles have influenced a good many of us. This includes me. Many times it's not what you say so much as it is how you say it. Where you get such similes I don't know. They're terrific. Your Mail For McCahill is without equal. I have chuckled for days over some crazy answers you gave to an inquiry. Congratulations on your tenth anniversary with this magazine. You're rendering a wonderful service to the*

[Continued on page 169]

THE GLASS-PACKED MUFFLER WITH THE DEEP, SMOOTH TONE...

Dyna-Glas
Exclusive, heavier, double-wrapped 24-gauge outer steel shell for longer life.
Fiberglas* packing contains both types of glass fibers – short and long for longer life and deep, mellow tones.
Straight-through design for power, with big 2" inner tubes.
16-gauge spun-locked, blowout-proof steel heads.
Spot-welded nipples with nonrestricting full collar.
Painted, lustrous gold color.

The big 2-inch straight-through tube of the Dyna-Glas muffler reduces back pressure to a minimum—gives you better performance, increased power, greater mileage. The combination of long and short Fiberglas* fibers in the packing eliminates the rasping tones common to many Hollywood type mufflers, and lets only the deep, rich power tones through. And its exclusive, heavier, double-wrapped 24-gauge outer shell makes certain your Dyna-Glas will last thousands of miles longer. Dyna-Glas duals and headers give your V8 top performance and power.

Ask your favorite dealer or automotive store for Dyna-Glas mufflers, duals and headers . . . and the famous steel-packed muffler, Dyna-Pak. For name and address of your nearest dealer write to

Dyna-Glas

Dept. 3F, Toledo 1, Ohio

*Trade-mark OCFCorp.

[*Continued from page* 148]

at the joint in the after deck. Run Kuhl's seam compound into the seams. Stain the deck and apply one coat of varnish right away for protection.

Construction of the cabin has been kept as simple as possible and ample sitting headroom is provided. The principal side supports are eight pieces of 1⅛x2¼-in. fir, four to a side. The back ones, at frame No. 4, are carried down to the floor frame and fastened to it with screws. The other uprights do not extend below the deck framing and are screwed to the longitudinals. It is necessary to bevel the lower ends of these uprights so that they will stand straight, as the longitudinals have an outward slant. The three aft uprights on each side are placed with the greater dimension running lengthwise; the forward ones are set in the opposite direction and notched to receive the roof stringers.

The front panel of the cabin goes on next. Use 1¼-in. No. 8 screws to fasten it to the uprights. Next, bend in the roof stringers, securing them to each upright with two 1¼-in. No. 8 screws. Cut the two back pieces of the cabin with care and stand them in place. It is best to make paper patterns of these, taking measurements from the inside of the boat since the ends must be flush with the inside of the hull. Notch the chines and sheer strips and, when fitted correctly, fasten them to the back uprights with 1¼-in. No. 8 screws.

Cut two more pieces of fir for door frames and screw them to the edges of the door opening. Run screws from plywood into fir. It will be found that these uprights, running down behind the slide rails for the removable panels, can be fastened to the floor beam for extra strength. Cut two fir end carlins and screw them to the plywood end pieces, allowing the outside ends to rest on the uprights. The inside ends butt against the door frames. Now saw out the carlin which fits against the front panel and fasten it in place with 1¼-in. No. 8 screws. The two fore and aft roof beams of ⅞x2-in. oak come next and are notched and screwed to the end carlins.

The cabin sides are ⅜-in. plywood and continue aft to a point six inches beyond the cockpit, acting as splashboards. The bottom edges are snug against the deck all along and must be trimmed in a slight upward curve to attain this. Screw the sides to the framework and clamp in place around the edges of the cockpit temporarily.

The splashboards are lined with ⅜-in. plywood of the same shape but extending down inside the cockpit to cover the deck framing. At the aft end of the cockpit the pieces are notched so the extremities will rest on the afterdeck alongside the splashboard. This gives a ¾-in. thickness to the splashboard. Remove the temporary clamps on the splashboard and screw it and the lining to the deck longitudinals. Side ports are cut now or later. The remaining roof carlins can now be put in. They are notched into the tops of the fore and aft roof beams and fastened with one screw at each joint. The roof is then covered with plywood in three sections, with joints meeting over the roof beams. The top edges of the cabin sides should have been previously beveled so the roof panels will fit snug.

The removable panels and the slide rails which hold them can now be fitted below the cabin doors. The top panel is rabbeted as shown to form a stop for the doors. Fasten the hatch slide rails to the cabin roof with 2-in. No. 10 screws, driven from the inside up through the roof panels. The hatch cover is made as shown, with the hinged flap on the front coming down over the door top when closed.

Construct the forward hatch cover also, following the sketch. Stain and varnish all exposed mahogany surfaces, if you have not already done so. Paint the outsides of the hull, cabin sides, front and ends with two coats of yacht white, flat. The entire inside of the boat should be given a priming coat of aluminum paint, followed by a coat of semi-gloss interior paint.

All the deck hardware, door hinges, rudder gudgeons, etc., may now be put on. The bow and stern chocks, bow plate, lip leaders and hinges are screw fastened; mooring bitt, gudgeons and cleats are through-bolted.

[*Continued on page* 186]

Mail For McCahill

[Continued from page 167]

American public. The best of luck to you.

Forrest L. Thorpe
Atlanta, Ga.

Gee, thanks.

● *You are a bum. Ten years of you is enough. Why don't you dry up, you old bald-headed windbag?*

Edgar Krause
Brooklyn, N. Y.

Good old True-Blue Krause.

● *Why do you clutter up your mail column with wise-cracking phonies? You could use this space for good serious automobile material. Let's cut out the sharp answers to nincompoops, as you must get enough serious letters to make these letters worthwhile reading.*

Hector W. Ulrich
Long Island City, N. Y.

Heck, Hector, the best fun I have in the magazine is selecting and answering a wide variety of letters. However, if enough other readers feel like you do I will drop all facetious correspondence and answers in favor of topics such as How To Get The Most Out Of Your Rear End. Or What Every Boy Should Know About Volumetric Efficiency. If that's what you want, just let me know.—*Tom McCahill* •

The Chevrolet

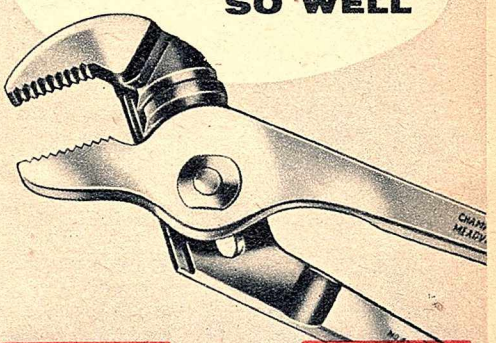
[Continued from page 89]

world of credit. Realizing that he built it with a price factor and general usefulness in mind, Cole doesn't have to take a back seat to anyone at Mercedes, Ferrari or any of the other accepted automotive greats.

Another big help was Cole's selection of material. The entire valve train of this engine is extremely light when compared to the competition (a key factor in allowing it to wind up so tight). Ounce for ounce and cubic inch for cubic inch, this Chevrolet engine is the greatest performing engine ever built in America, bar none. Risking repetition and considering that low price was a major design factor, this engine might very well be rated the

[Continued on page 170]

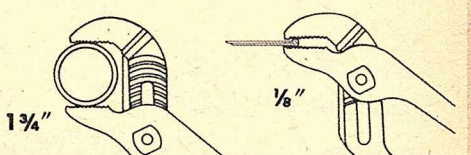
no other plier does so many jobs SO WELL



CHANNELLOCK®

No. 420

GRIPS LIKE A PIPE WRENCH



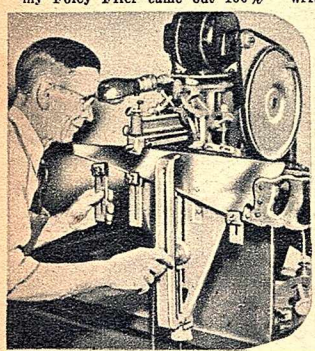
Help yourself to a Channellock No. 420 . . . the handiest plier of them all. With this handy plier, you can grip anything from a cotter pin to a 1¾" hex nut. And what gripping power! Just like a pipe wrench. What's more, Channellock is streamlined . . . easy to use in hard-to-get-at places. This all 'round usefulness is the reason why Channellock is the favorite plier of craftsmen everywhere. It'll be your favorite, too . . . for the same reason. Ask your hardware man for a Channellock No. 420.

BE SURE IT'S A GENUINE CHANNELLOCK

CHAMPION DEARMENT TOOL CO. MEADVILLE, PA.

FREE PLAN
tells how to start your own business
FILING SAWS

Here is a steady repeat cash business you can start in your own basement or garage in your spare time. You can file hand, band and cross-cut circular saws on the Foley Saw Filer. No eye-strain—no experience needed. "The first saw I sharpened with my Foley Filer came out 100%"—writes Clarence E. Parsons.



Every saw you sharpen with the Foley Saw Filer brings you more customers. "I rented a two-car garage and have all the work I can do" —Charles H. Smith.

FREE BOOK

"Money Making Facts" shows just how you can start at home in spare time, with small investment, no overhead—and develop into a full-time repair shop. Send coupon today—no salesman will call.

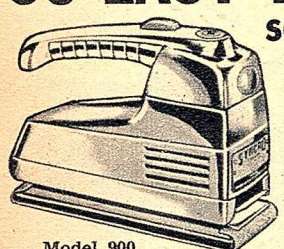
Send Coupon for FREE BOOK

FOLEY MFG. CO., 615-6 Foley Bldg.
Minneapolis 18, Minn.
Send me free book "Money Making Facts."

Name_____

Address_____

SO EASY TO USE...
SO POWERFUL... SO DURABLE!
and



SYNCRO POWER UNITS GUARANTEED AGAINST BURN-OUT DURING YOUR OWNERSHIP OR REPLACED FREE!

Model 900
Heavy duty. Outsands, outlasts others. Has our exclusive No-Jumping, Multi-Motion sanding action $39.95

Model 504
Light. Powerful. Easiest for vertical use. America's greatest finish sander $19.95

SYNCRO SANDERS Feature the MODERN SYNCRO RECIPROCATING MOTOR . . today's greatest achievement of all electro-mechanical research! Powerful! Smooth! No cams, belts or gears. No rotating parts to wear out. No brushes to burn out. See sanders at stores. Write Syncro for Free catalog and sanding handbook.

MULTI-MOTION
SYNCRO
SANDERS
SYNCRO CORPORATION
DEPT. 3-A6
OXFORD, MICHIGAN, U. S. A.

WORLD'S LARGEST MANUFACTURER OF RECIPROCATING MOTORS

The Chevrolet

[*Continued from page* 169]

greatest competition engine ever built. It undoubtedly is from a dollar-and-cents standpoint.

But now, just in case you might be getting the idea that I think this is the perfect car, let me say this at once: in my opinion, these cars, in order to stay together in hard use, definitely should have a stabilizer bar in the front end. You can buy this as an accessory at nearly all Chevrolet dealers but I think the factory should have tossed it in as standard. The front end has been beefed-up over '55—so has the whole car as a matter of fact—but it still needs the stabilizer bar. When I was testing this car with Jack Tapscott, with Jack at the wheel, we hit a two-foot rut and the whole front end made a crashing noise similar to dropping an anvil on plate glass. If I hadn't braced myself just above the windshield with both hands, having seen the rut coming, I'd have been riding the hood ornament bareback. A little more guts in the front end and this would be a much greater car.

Summing up: this bargain-price Mercedes is the greatest performance buy ever offered at any time in America. It would whiz by a Duesenberg like Halley's Comet and the vacuum as it went by would suck the stork off an Hispano-Suiza. The car I tested can be bought by anyone for two thousand dollars and if performance is your meat, just bear in mind that this two-door, five-passenger sedan would run away from a Jaguar XK120 of just two or three years ago as if the Jag had just dropped its engine.

On these pages you old readers may remember that as long as eight or nine years ago we pointed out that if the American manufacturer ever decided to build the best-performing cars in the world they could do it in a matter of months. The fastest high-performance sedan built in Europe today is the Bentley Continental costing roughly $20,000. This Chevrolet, costing ten per cent of that, could eat it alive even with an unwarmed-up engine. •

When answering advertisements please mention MECHANIX ILLUSTRATED

Car Outlook For 1957

[*Continued from page* 63]

and more stainless steel is being used and will be used.

Inside those cars of 1957 will be many innovations. First off, the upholstery. Synthetics that are again brand-new will come into sight for fabrics, and they will be more practical than in the past. Their designs will tend to obscure dirt and they will clean up more readily. Once again they will be brighter and more lively, in line with the trend toward happier colors and combinations on the outside.

Individual seat swiveling, something inevitable some day, may turn up. Front passengers may be able to swing their seats at least 45 degrees outward to make entrance and departure easier. And you'll see more cars next year with reversible seat cushions.

Dashboards will be largely padded (there was substantial movement that way in 1956) and finished in colors to match the rest of the interior. Controls will be more inconspicuous than before. With these bows in the direction of safety, another innovation may appear—redesigned steering wheels, some like the "deep dish" idea stressed so strongly last fall.

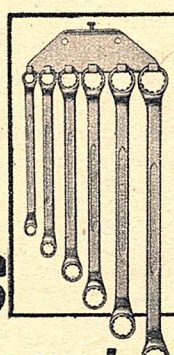
That steering wheel, incidentally, will be changed in another particular. The tendency will be to reduce the number of turns from lock to lock, particularly among the larger cars, so you won't have to do as much work swinging around a corner. That kind of reduction is possible because of the growing use of power steering, all but standard on the higher priced cars.

That power option brings up others. The day is fast approaching when automatic transmissions will be standard equipment rather than available on order. The 1956 model year saw many lines install automatic drives as regular equipment and this drift will broaden for 1957.

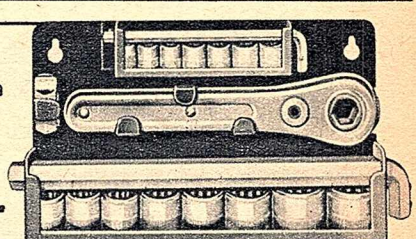
Air conditioning, if you're interested, will once more be lower in price. It is steadily pointing toward the day when it

[*Continued on page* 172]

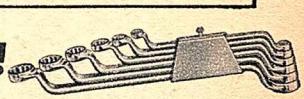
It's EASIER to "DO-IT-YOURSELF" when Indestro UTILITY HOLDERS . . . keep tools in easy reach!



YOURS AT NO EXTRA COST!



when you buy these Indestro wrench or socket sets



Householders, Car Owners, Mechanics, Home Workshop Hobbyists! You'll want to mount these handy Utility Holders on the wall alongside your work bench . . . a convenient place to keep wrenches and sockets where they can be quickly removed or returned. You always know where to find them. Wall-Klips or Holders actually cost you nothing as they are *included* with Indestro Wrench and Socket Sets described here.

See them at the hardware, implement, auto supply or variety store that sells Indestro Tools, or write us for name of your nearest Indestro Dealer.

Double-Duty Wall-Klips *included* with these socket sets

Bright red or green baked enamel finish Wall-Klip of sturdy, one-piece construction that keeps tools orderly and firmly in place yet easily removable as needed. Two key-slots for wall mounting. Wall-Klip with following 19-piece Indestro Socket Set No. 1454: ½" Hex Drive: 8 Sockets, 7/16" to 15/16": 6¾" Ratchet; 9¼" L-handle, Screw Driver Adaptor; ¼" Hex Drive: 5 Hex and 2 Square Sockets and 4" L-handle. An 11-piece set with Wall-Klip is also available, if preferred.

Klip-Tite Holders *included* with these Indestro Wrenches

Box End Wrenches illustrated are packaged in red-enameled metal holders that open up to form convenient wall-bracket with two holes for easy mounting. Six wrenches in Klip-Tite Holder:

No. 910-5W, Range 3/8" to 1": Set includes 3/8 x 7/16", 1/2 x 9/16", 5/8 x 11/16", 3/4 x 25/32", 13/16 x 7/8", 15/16 x 1". Also available with Combination Wrenches.

INDESTRO TOOLS FOR INDUSTRY

INDESTRO MFG. CO.

NORTH KILDARE at SCHUBERT • CHICAGO 39, ILLINOIS

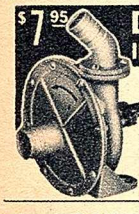
BIG NEW
YANKEE HANDYMAN No. 633H
Spiral Screw Driver ®

$5.98
Just Push...
Drive Screws Fast

Here's a new "Yankee" Tool with a built-in formula for faster, easier work — 1 push and you turn the screw a number of times — yes, every stroke turns the screw a number of times, and with the quick-return action you are ready for the next stroke immediately.

This Spiral Ratchet Screw Driver does more than drive and draw screws. It drills holes in wood, plastic or plaster, and countersinks for head of screw. In addition to Screw Driver Bit in chuck, 3 Drills and a Countersink come in magazine handle. A "Yankee" tool from the Tool Box of the World. At your hardware store now.

STANLEY



$7.95
DRAINS cellars, cisterns, wash tubs;
IRRIGATES - CIRCULATES - SPRAYS
1,001 USES—HOUSE, GARDEN, FARM
Original All Purpose Pump has 3,000 GPH capacity. 450 GPH 80' high; or 1,800 GPH from 25' well. Use any 1/6 to 3/4 HP motor. Stainless steel shaft. Oil-less bearing. 1" inlet; 3/4" outlet. Motor coupling included.
DOES NOT RUST OR CLOG!
Postpaid if cash with order. Send for yours today. MONEY BACK GUARANTEE. Larger Centrifugal Pumps, and Gear Pumps in all sizes.
LABAWCO PUMPS, Belle Mead 30, New Jersey

DO IT BETTER . . .
DO IT WITH DP®

CAULK
GLAZE
SEAL
PATCH

Prevent drafts, moisture, damage and deterioration the easy way. Use D-P Caulking Compound . . . in cans or handy cartridges for gun use. Always stays in condition for immediate use. Fill cracks in brick, stone, wood. D-P stays in place permanently. Get D-P glazing, sealing and caulking compounds or putties at all good stores!

Ask your dealer for D-P Products.

THE DICKS PONTIUS CO.
5301 Huberville Ave., Dayton 3, Ohio
INSIST ON D-P BEST SINCE 1867

Car Outlook For 1957

[Continued from page 171]

will become standard equipment on most cars, and when those cars will be sealed units without movable windows, providing man-made temperatures and drafts as desired.

More windows will be power-operated in 1957. Visualizing the console of buttons to control the windows brings up the anticipation of another dash at the driver's side containing buttons that will lock and unlock the doors on the right-hand side of the automobile.

The change that no one will be able to see on the 1957 cars, but the one that may mean more than nearly any of the others, is a far-reaching modification under the hood. Detroit expects that one maker, maybe more, will use fuel injection on 1957's rather than an orthodox carburetor.

For the great majority of car buyers, fuel injection, although not new, will be something unfamiliar. The carburetor is eliminated and a series of nozzles set up, one for each cylinder. For each of these nozzles, a system of mixing air and gas and feeding it directly to the firing chamber is used. You then have fuel injection. Provided the separate nozzles are properly adjusted, engine performance is perfectly even, cylinder to cylinder, and ideally economical. The engine runs smoother than it possibly could any other way and it burns the minimum amount of fuel. It's more silent and tends to vibrate less.

That is the mechanical virtue of a fuel injection system. But there's another of equal importance to the car-makers who consider mechanics in relation to styling. Fuel injection—and it is all but finally specified for at least one 1957 automobile—can make possible some really remarkable changes in design.

The reason is the carburetor—or the lack of a carburetor. Each carburetor, as you know, has to have an air cleaner attached so the air fed to the mixing chamber contains no dirt or particles that will clog up the tiny passages of the carburetor. The bulkiness of the air cleaner is the reason hoods are as high as they have been. With carburetor and cleaner eliminated, it's possible to lower the hood.

And it will be lowered. That's the big-

gest styling development expected to come out in the 1957 models. Cars with fuel injection can confidently be expected to have hoods as much as six inches lower.

To cope with problems created by lowering of the entire automobile, suspension systems may well undergo modification. There's industry talk of independent suspension at all four wheels rather than on the two front wheels only. Some think that this individual suspension will come about by use of air bellows, like those announced by one truck producer a few years ago, in conjunction with more orthodox springing mechanisms. Others, however, think the air suspension for passenger car is definitely longer than a year away.

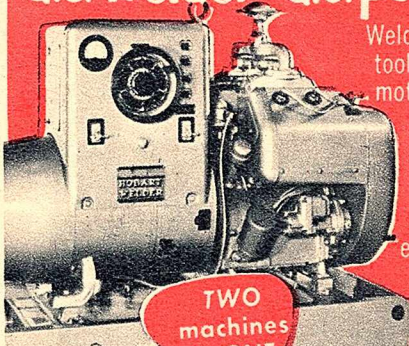
It has been reported that Plymouth, Dodge, DeSoto, Chrysler and Imperial autos for '57 will be equipped with torsion bar suspension on the front end, replacing the present coil springs. Chrysler is reportedly making its own torsion bars and is tooling up now for production. Packard was the first car-maker to introduce this type spring on its '55 models.

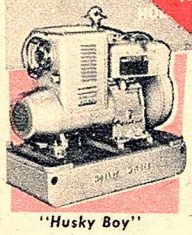
Aside from the fuel injection system (and that only on one or maybe two models) the single change of note for 1957 under the hood will be, again, more compression. The air in the firing chambers will be squeezed more tightly than ever before, just as it has been in recent years to keep pace with better gasolines. The result will be still more exciting performance and more horsepower, amplified still another notch with the use of fuel injection.

You've read over and over again about gas turbine engines and how they may replace today's spark-fired motors. Gas turbines will come, to be sure, and with them may come the use of diesel engines in passenger cars. Chrysler Corp. already has a diesel-powered Plymouth Belvedere four-door sedan in production in Belgium. Its four-cylinder mill is rated at 40 hp. You probably won't see any production gas turbines or diesels on American roads next year, but the changes you will see are startling enough to mark 1957 as one of the most exciting years in automotive history. •

When answering advertisements please mention
MECHANIX ILLUSTRATED

Make BIG MONEY
with this combination
a.c. welder-a.c. power
Welds or runs tools, lights, motors, etc.
A REAL PROFIT MAKER for emergency repair jobs
TWO machines in ONE

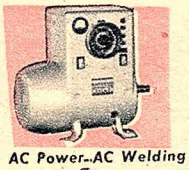



"Husky Boy"

200 Amp. AC Welder-AC Power Combination, four cylinder air-cooled engine. Furnishes 200 amperes of welding current and 5,000 watts of AC power alternately. Easily mounted on your truck or trailer for quickly getting to where it's needed on a moment's notice.

"Husky Boy" 200 amp. welder driven by a 2 cylinder air-cooled engine. Perfect for outside or around the shop welding. Handles the big pay jobs.

AC Power or AC Welder. An excellent dual purpose combination available in 200 and 300 amp. welding sizes. Can be belted or coupled direct to your own gas engine.


AC Power-AC Welding

Transformer Type AC Welder 250 amp. A real welder for production and repair work in shops that have only single phase power available.

AC Transformer

"Bantam Champ" 250 amp. electric motor driven welder for general shop use. Ideal where compactness and low investment are prime considerations.

Investigate these BIG MONEY MAKERS today

Hobart School of Arc Welding
Learn arc welding quickly by actual on the job experience at the nonprofit Hobart Trade School. Complete or partial courses.

"Bantam Champ"

Modern Arc Welding Lessons
200 pages. Fully illustrated. Learn practical arc welding in your spare time.....Only $1.00.

Clip this COUPON and mail today

HOBART BROTHERS CO., BOX SM-66, Troy, Ohio, Phone 21223
"One of the world's largest builders of arc welding equipment."

HOBART BROTHERS CO., BOX SM-66, TROY, OHIO
Please send additional data on items checked:
☐ "Husky Boy" ☐ AC Power—AC Welding
☐ AC Transformer ☐ "Bantam Champ"
☐ Hobart Welding School ☐ Welding Lessons, $1.00 ☐ Weldor's Vest Pocket Guide
free!

NAME_____
ADDRESS_____
CITY_____STATE_____

BIGGEST SAW VALUE
in power tool history!

Completely NEW
DURO MASTER
8" Tilting
Arbor Saw

Here is everything you ever wanted in a power saw. Design, quality, precision, ruggedness and low cost. The *all new* DURO MASTER 8" Tilting Arbor Saw includes all important features and operating advantages including: "floating" motor shift, rugged "quick lock" rip fence, handy blade raising and lowering knob, one piece steel frame, convenient blade tilting mechanism with graduated scale and modern safety guard. *And* only DURO MASTER offers built-in conversion and adaption features for tomorrow's needs, too!

ONLY
$48.45
less extensions, splitter and guard

$53.45 as illustrated

Write for FREE Brochure
and power tool catalog giving full details and specifications on this remarkable new saw.

DURO METAL PRODUCTS COMPANY
2699 N. KILDARE AVE. • CHICAGO 39, ILLINOIS

only $95 freight incl. Write For FREE FOLDER

12 ft. SPORTBOAT KIT

Includes ready-cut parts and hardware. Models low as $39.00 freight incl.

TAFT MARINE WOODCRAFT
Dept. MI-6, 636 39th Ave. N.E., Minneapolis 21, Minn.

NOW, THE 3-IN-1 PENETRATING FINISH...

McCLOSKEY TUNGSEAL

A complete finish for all wood floors, furniture, paneling, trim, bar tops—stains, seals and finishes all in one operation.

So easy—you can do it yourself

Tungseal brings out the beautiful grain of natural wood and protects it with a hard, elastic, penetrating finish that successfully resists alcohol, caustics, detergents, scuffing and abrasion. Available in 12 popular colors and clear.

Get in touch with the dealer who handles McCloskey or write us direct.

McCLOSKEY VARNISH CO.
Philadelphia • Chicago • Los Angeles • Portland, Ore.

The Chrysler 300B

[*Continued from page* 93]

hook-up. This would be a much more satisfactory outfit, in my opinion, for anyone not planning to enter competition—except for an occasional rush on the turnpike or in a traffic light Grand Prix. I'd also stick with the new three-speed pushbutton transmission unless the gearbox has been smoothed out considerably, because if you miss in one of these lumpy box deals when trying to beat your iceman down to the corner you stand a good chance of creating a hailstorm of gear teeth.

Some other failings in this car are in the instrument panel, which has been a criticism of mine with most Chrysler cars. The instruments are far too small and hard to read, especially the Lilliputian-sized speedometer. At the price they sell for, plus the purpose they were built for, these cars should all come equipped with large, easy-to-read tachometers as a guide for the driver when he gets into high speeds. Most of the 300B's running during Speed Week had electric tachs that were put on by their owners.

These cars steer far better than they did last year, when not equipped with power steering, and most of the ones that are raced don't go in for this accessory. In the cornering department, the 300B's are as stiff as an Englishman's upper lip and in action are very similar to the old Mexican Lincolns. They are, however, slightly tail-light and on slippery surfaces can be made to break without too much wheel snap. I had several requests from 300B drivers to allow them to add weight in their trunk compartments for the Speed Trials to cut down wheel slippage but I had to refuse because of safety regulations. This year adding extra weight in car trunks was ruled out because, in the event of a spin or a car getting out of control, such weighted objects might easily burst through the trunk compartment partition, adding several more hazards for a driver already in plenty of trouble.

As we wrote last year, the lush genuine leather upholstery and interior appointments spell quality with a capital Q. The leather is glove texture in feel and in the tan and buff shades simulates fine chamois, though of course it is much stronger. Like

most large Chryslers the 300B has a glove compartment in which two average-sized mice would feel crowded.

In summing up, the Chrysler 300B's are the ablest sedans ever built—bar none. When well-tuned on a hardtop road they can be expected to do better than 140 mph if not too overloaded with accessories. In the tests I made, zero to 60 mph averaged 8.4 and 0-80 mph took 12.9 seconds. An interesting point is how these big cars start to move when under way. For example, the best time zero to 30 mph averaged 3.7 seconds—not fantastically exceptional. It got to 50 mph in 6.8 seconds which was a lapse of 3.1 seconds from its 30 mph time; reached 60 mph in 8.4, 70 mph in 10.5 and 80 mph in 12.9, and got up to 100 mph in under 19 seconds—from a dead standstill. If you'll consult the Chevy test in this issue you'll notice that the Chevy outjumps the 300B up to 50 mph but is topped when the two cars reach 60. If you're in the market for a mastodon of muscle or a car for running to the station in nothing flat plus one that'll win all arguments across the polished mahogany, this is it. A great car—but before I'd buy one I'd tame it just a bit. •

Test Your Fishing Tackle

[*Continued from page* 105]

another) I've seen fishermen lose what might have been record catches—simply because they used the wrong kind of tackle.

One of the commonest mistakes is that of selecting the improper strength line. Practically all fishermen use a line that is too heavy for the kind of fish they are out to catch. As a result, the reel is overworked, the line is given to frequent snarling and the outfit as a whole remains unbalanced.

Consider, for example, an angler who feels he is going to land a fish of 40 pounds. He need not purchase a 40-pound test line. Exhaustive surveys made by sportsmen, as well as tackle manufacturers, reveal that the line strength required will depend upon three factors: 1. the bending of the rod (which can assume as much as 40-50 per cent of the work load, or, in this case, 16-20 pounds); 2. the dragging ability of

[*Continued on page* 176]

Herb Thomas
—ace driver of NASCAR (National Association for Stock Car Auto Racing), says:

"We give oil filters their toughest test

—and we pick Purolator for every make of car!"

Protect your car like the "pro's" do! Because a Purolator can trap up to 3 pounds of grit in one NASCAR race, 9 out of 10 drivers use Purolators *whichever make of car they drive!*

Purolator Micronic filters stop dirt fine as 39 millionths of an inch . . . have up to 10 times greater capacity than many oil filters.

Ask your serviceman to put in a Purolator refill every 4,000 miles—when he changes your oil. Takes only minutes. From $1.60.

© 1956, Purolator Products, Inc., Rahway, N. J.; Toronto, Canada.

"Purolator" and "Micronic," Reg. U. S. Pat. Off.

Proved best for every make of car

PurOlator

OIL FILTERS

Soldering is Easy

with INSTANT STARTING

Lenk

LIQUEFIED LP PETROLEUM

Torch

only $3.49

THE ONLY THROW-AWAY FUEL CONTAINER WITH SELF-SEALING SAFETY VALVE.

Here's what you can do:
- regular soldering, sweat fittings,
- silver soldering, refinish furniture,
- remove paint and putty.

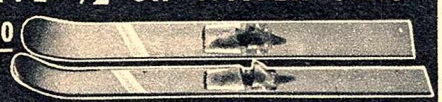
Available at Hardware Counters Everywhere

Write for FREE Soldering Instructions

THE Lenk MFG. CO.
BOSTON 15, MASS.

SAVE 1/2 on WATER SKIS

$18.00



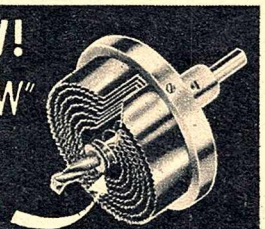
Simply assemble and finish our new water ski kit and you have a pair of skis worth twice the price of the kit. Skis are 7 ply moulded plywood, 67½" long, 7" wide, 9/16" thick. Sturdy rubber foot pieces. All parts plus instructions included — $18.00. Order from your Michigan dealer or MICHIGAN WHEEL CO., Dept. M-6, Grand Rapids, Mich. C.O.D. orders accepted.

BRAND NEW!

"ARCO HOLE-SAW"

with AUTOMATIC

SLUG-EJECTOR



Fits any Electric Drill, Lathe, Drill-Press or Motor. Exclusive "Slug-Ejector" pops out discs immediately—therefore works 3-times faster than other hole saws selling for twice as much. **7 shatterproof blades** easily exchanged to cut 1", 1¼", 1½", 1¾", 2", 2¼" & 2½" holes thru any ¾" stock. **Safety-lock screw** prevents blades from "jumping out." Incl. ¼" drill bit **$6.50**

No. 600 "ARCO HOLE-SAW"—as above, but with 4 blades to cut 1", 1½", 2" & 2½" holes **$4.95**

At your dealer or try it on our 10-day trial.

Send check, M.O. (ppd). C.O.D. plus post.

ARROW METAL PRODUCTS CO.

Dept. MI-6, 140 WEST BROADWAY, NEW YORK 13, N. Y.

Test Your Fishing Tackle

[*Continued from page* 175]

the reel (another 50 per cent, or 20 pounds); 3. the strength of the line. Hence, in this particular instance it is obvious that the line need only be capable of handling a maximum weight of ten pounds, or only one-quarter that of the 40-pound fish which the angler expects to land.

The choice of a rod, unlike the reel and line, becomes a matter of compromise. A too-limber rod will not permit the angler to set the hook properly, following a strike. Conversely, a too-stiff rod invites breakage. A happy medium would be a stick which has enough "backbone" to offer a formidable weapon to the type of fish that is to be landed, yet one limber enough to absorb much of the strain to which the fisherman's arms and wrists would otherwise fall heir.

One easy way to select your rod (or "tip") is to determine what strength line you need to handle the size fish you intend to catch. Then, with such line in place on the bait casting, spin or fly reel you intend to fish with, proceed to balance such a reel to a rod that appeals to you.

Next, enlist the aid of a companion to hold and observe a spring scale to which the free end of the line has been fastened. Finally, backing away from your assistant (as though he were the fish) let out about 50 feet of line before locking the reel (using the reel brake or your thumb). Now pull back carefully against the straining rod tip, meanwhile noting the extent of its bending, until the man holding the scale calls out that the pressure you have exerted in pounds of pull exactly equals the breaking strength of the line, as specified by the manufacturer.

In this manner you can tell at a glance whether you have selected a stick too rigid or too limber for the size line you will be using. It should be obvious why this method of determining rod "give" is superior to the more common practice of holding out the stick at arm's length and "whipping" it (especially when the rod is not balanced by the reel and line that will be used under actual fishing conditions).

Fishing reels should also come under close scrutiny from prospective pur-

chasers. To avoid needless mechanical strain and angler fatigue, the reel should be kept nearly full with line, since considerably more line is retrieved per turn by a full spool than by one that is half full, or even less. This means that the buyer will first have to decide how much line will be needed; whether he must be prepared to meet the 100 yard initial run of the bonefish, for example, or the comparatively shorter dashes of the trouts and pan fishes. In general, it is more sporting—and hence more fun and less fatiguing—to use as small a reel as one possibly can.

In any event, the spool should not be loaded to more than 85 per cent of its dry capacity, since the line will tend to swell and occupy more space when it gets wet (this is true mostly in the case of linen lines).

And don't forget, if you do get a big fish on while using a small reel that has no braking provision, watch your thumb! I once witnessed a fishing companion give himself a bad burn simply because no one had ever shown him how to slow down a screeching reel under such circumstances. Had he applied thumb pressure against the rapidly spinning spool face on the inside of the reel housing—instead of directly to the line—he wouldn't have gotten hurt.

Not much can be said of lures, of course, since these will invariably reveal their effectiveness only under conditions of actual use. However, the angler will do well to ascertain beforehand that he will not be attempting to use fresh water artificials in salt water, thereby inviting quick corrosion and reduced efficiency. He should also file all hooks that are not sharp. Above all, he will do well to avoid the common mistake of carrying too much in his tackle box, thereby needlessly tiring himself.

If he is to use such items as boat, motor and tent on his field trip the wise sportsman will first test these to see that they are in good working condition; that he can operate them easily without assistance should he plan to travel alone. Remember, it is much easier to correct a trouble in the home workshop than in strange surroundings.

If you will heed these simple rules you'll find fishing to be easier, more profitable—and more fun. •

H-W-R stops hydraulic lifter noise . . . keeps your engine clean, restores power . . . gives smoother, quieter performance . . . rids automatic transmission of jar and jerk. Results guaranteed or *Double-Your-Money-Back!*

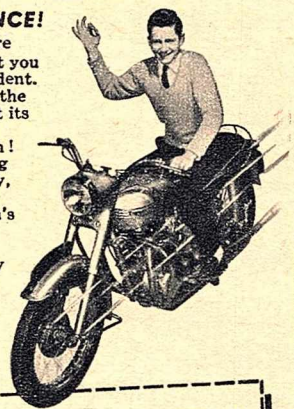
HASTINGS MANUFACTURING CO., HASTINGS, MICHIGAN

HASTINGS

Buy these Hastings Products with confidence:
H-W-R, Casite, Piston Rings
Oil Filters, Spark Plugs

GET UP AND GO WITH A TRIUMPH

FUN! INDEPENDENCE! ECONOMY! Go where you want to go; do what you want to do. Be independent. Have more fun! Enjoy the thrill of motorcycling at its BEST with a gleaming, precision-made Triumph! Easy to ride . . . exciting to own . . . real economy, too—60 to 90 miles and up per gallon. Triumph's two-level cushion seat means real comfort for two! Priced surprisingly low, with easy terms available. See your nearest Triumph dealer for a free demonstration. He will teach you to ride.



RUSH THIS COUPON to nearest address below. Dept. M

THE TRIUMPH CORP. Towson, Baltimore 4, Maryland

JOHNSON MOTORS, INC. 267 W. Colorado St. Pasadena 1, Calif.

Send me absolutely FREE the 1956 Triumph Motorcycle catalogue in full color. If under 16 years of age, check square for special pictures. ☐

NAME_____

ADDRESS_____ PHONE_____

Stiff lock?

The key to a stiff lock is 3-IN-ONE Oil. Quickly penetrates, lubricates and prevents rust—without leaving gummy deposits as other oils do.

"3-IN-ONE" OIL®

Over 3,885 lbs. Actual Tensile Strength per Square Inch.

LEISURE TIME SPENT PROFITABLY

Most hobbies are fun but few are as profitable as woodworking. Handy household articles . . . children's toys . . . attractive and useful furniture for the home . . . all can be made easily and economically with a set of Rogers easy-to-follow Project Plans. When working with Rogers Glue you are assured maximum strength. Always uniform — ready to use — clear and dependable — Rogers Glue is made only from the finest materials.

Send only 15c for Rogers *Special Offer:* A full-sized jar of Rogers Glue — a set of illustrated, easy-to-follow Project Plans and the new 1955 edition of "Rogers Book of Woodworking Shop Notes".

Leisure time can be both satisfying and profitable. Write:

ROGERS *the best* LIQUID FISH GLUE
GLOUCESTER, MASS.

QUESTION OF THE MONTH

Is the Communist conspiracy to conquer America an imminent danger at present? Are subversive elements in this country being held in check?

Asked of: J. Edgar Hoover, Director of the FBI.

YES, Communism today does represent a great danger to America. Our democratic way of life is threatened by a gigantic tyranny which already has engulfed millions of freedom-loving people.

The Communists seek to establish a dictatorship. They would replace freedom, justice and love with tyranny, terror and hatred.

This threat, however, is being met by the determined vigilance of the American people. Using democratic methods, this nation is defending itself against the assaults of the Communist International. As long as law and order reign and citizens have faith in the democratic processes of government, Communism cannot win in this struggle of ideologies.

The FBI, as the governmental agency responsible for the internal security of our country, is keeping close track of Communist machinations. Any person can be of assistance to us in this cause. A citizen having information about subversive activities should contact the closest FBI office immediately.

We can conquer this menace. It is the job of all of us. •

Cooling For Your Home

[*Continued from page* 160]

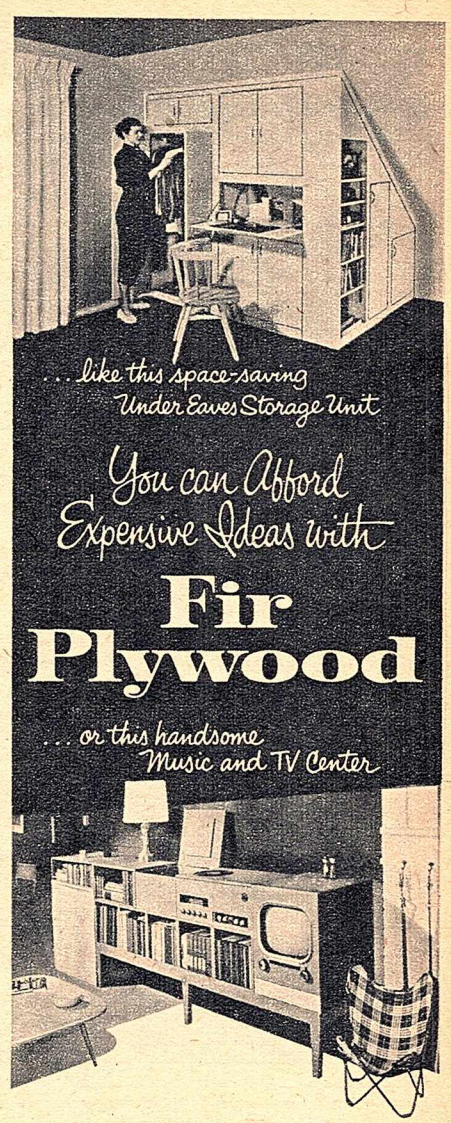
set-up can be adapted for ventilation. In those cases where the stove is along an outside wall, the fan can be easily mounted through the wall with its inlet behind and slightly above the burner level. When the range is along an inside wall or when it is for some reason impractical to cut a hole through the wall, the fan is mounted in the ceiling with its inlet opening and its decorative grill inside the kitchen. The motor and impeller is either inside the stud or joist space or on the outside. Some models are designed so that the motor mounts outside to cut down on noise. In both cases the exhaust opening and its automatic louver grill or door is out of doors.

There are several variations on these two basic installation plans. Let's say, for instance, that your stove is along an inside wall but you can't use a ceiling fan because there is a finished room above. In such a case the fan's inlet and outlet are decoupled, the inlet is placed in the wall or ceiling behind or over the range and the outlet is placed in an outside wall. The two are then joined with galvanized ductwork hidden in the ceiling, walls or cabinets. Most models of kitchen type fans are designed and built

[*Continued on page* 185]

Fan Dia.	Test Method	CFM Range Same Fans
16"	NEMA	1900-2400
	NAFM	1300-1600
18"	NEMA	2500-3100
	NAFM	1700-2100
20"	NEMA	3100-4000
	NAFM	2100-2700
22"	NEMA	3700-4500
	NAFM	2500-3100
24"	NEMA	4000-4800
	NAFM	3000-3700
30"	NEMA	7500-8500
	NAFM	5600-7000

Ratings vary depending on test set-ups. Use NAFM rating in case of exhaust fans.



Give your home the "custom touch" with fir plywood. Whether you use it for smart, good-looking built-ins . . . strong, rigid subfloors and sheathing . . . or distinctive exterior siding—you'll find fir plywood fits your plans *and* your budget. Created by nature, improved by man, fir plywood is real wood made larger, stronger . . . better looking and more versatile.

Grademarked for your protection, fir plywood comes in standard grades as well as special textured or overlaid panels. DFPA industry grademarks attest quality, performance, value.

DFPA TESTED QUALITY

Plans Available; See your lumber dealer or write (U.S.A. Only) Douglas Fir Plywood Association, Tacoma 2, Wash., Dept. 12. Please order plans by name, enclose 10c for each.

[Continued from page 163]

tape, the tube of silicone grease, a small can of shellac or other oil base paint, the 6199, a piece of either silk or rayon cloth, and the aluminum crystal holder. Fill the top part with silicone grease, working it to the edges with the finger. Take a piece of ¼-inch thick sponge rubber, cut to fit the inside of the top of the can, and with the fingers work the silicone grease into the rubber until it is thoroughly soaked. Now, insert it in place inside the top of the can. The grease will hold it in place. The rubber will keep the crystal pressed against the 6199 when the job is completed. This is important for the probe to work properly.

Remove the crystal from the seal in which it came, and holding it with the piece of wrapping in which it came (don't touch it with the fingers), polish one side of it on the emery until all scratches have been removed from the surface. The polishing must be done very slowly so as not to build up heat as this will cause the crystal surface to become soft, making it impossible to continue the polishing. You will then have to wait 'til it cools and hardens before you can start to polish again.

When all the scratches have been removed polish the crystal a little more on the silk or rayon cloth and try to get a real smooth surface. Next, apply a thin coat of silicone grease all over the crystal and on the part of the 6199 that will be against it and press the crystal in place on the 6199, moving and turning it to make sure you get out any air bubbles. Now, take the aluminum can and place it over the crystal, slowly pressing it down and forcing out the excess grease until you are reasonably sure it won't go down any more, and that the sponge rubber inside the can is against the crystal. Wipe away the excess grease and pressing the can down firmly, apply the waterproof tape all around the can and the 6199, making the tape hold the two together. Paint over the tape to insure that the crystal will be sealed against moisture since this will ruin the crystal in a few days.

If you do not want to do this part of the work, you can buy the crystal already polished, canned and sealed; this however will cost quite a bit more.

After the crystal is mounted apply a few layers of regular friction tape around the 6199 to take up the space between it and the metal tube so it won't rattle around. Solder a wire from the connecting cable shielding to the metal tube on the inside, grounding the tube. Make this wire long enough so that when you remove the 6199 from the tube you will have a little leeway. Plug the 6199 in its socket.

Install the probe into the metal tube and close it up, making sure that the crystal holder protrudes through the hole that has been cut for it in the other end of the metal tube. Having done this, the instrument is now ready for use. Plug the probe into the main cabinet and turn everything on except the HV. Adjust the set as described earlier so that it is ready for use. Now, turn on the HV and readjust where necessary. It is a good idea to get a piece of radioactive rock to test with. There are several places that sell these, one of which is Ken Research, 525 Rivervale Road, Rivervale, N. J. They have calibrated samples with which you may also check the calibration of your completed scintillometer. Use these samples to check the calibration on each range of the range switch to see that it is working properly.

As stated earlier, if you don't have the proper test equipment to test the HV, you can find the correct voltage on the voltage divider resistors. First, connect the HV lead of the probe to the last resistor and try to get the instrument to work by setting it up and holding a radioactive sample in front of the probe. If it works then leave it as is. If it doesn't, then you have to determine if the voltage is too high or too low as follows: Slowly adjust the bias control one way then the other; this should cause the needle to swing from one end of the scale to the other. If it doesn't, the voltage is too high and you need more resistors in series. Most likely, however, the voltage will be too low which will be shown by placing a radioactive sample near the probe, moving it slowly closer. The needle will start to rise and as you get closer it will reach a certain point and then start to

[Continued on page 182]

Golden Hammer Awards

[Continued from page 129]

Minn. . . . Carl Dakin, Plainville, Conn. . . . Olav Barstein, Kristiansund, Norway . . . Bill Jenkins, Washington, D. C. . . . C. H. Hubbard, St. Louis, Mo. . . . L. S. Crossman, Esquimalt, Canada . . . K. A. Carlson, Goleta, Cal.

CERTIFICATES OF MERIT have been awarded to the following craftsmen:

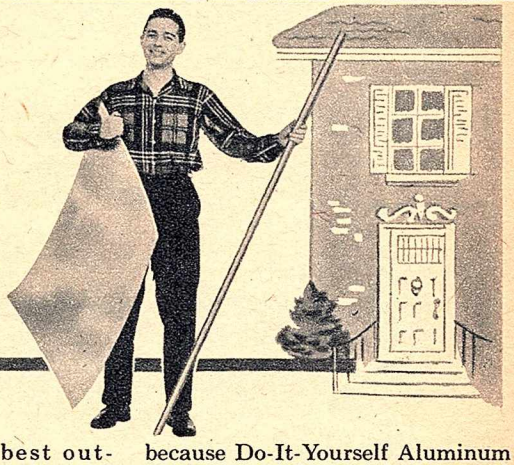
E. Larson, Arlington Heights, Ill. . . . Tom Long, Newton, N. C. . . . Charles Zepfel, Egg Harbor City, N. J. . . . Osvald Langdolen, Minot, N. D. . . . Olge Oxford, Middlesboro, Ky. . . . Norman Greenberg, Montreal, Canada . . . Kenneth Segura, Beaumont, Tex. . . . Keith Bradley, Toronto, Canada . . . M. Ailshie, Knoxville, Tenn. . . . Joseph Nizolek, Trenton, N. J. . . . Kenneth Sprague, Kewanee, Ill. . . . Roy Parcell, Cleveland, Ohio . . .

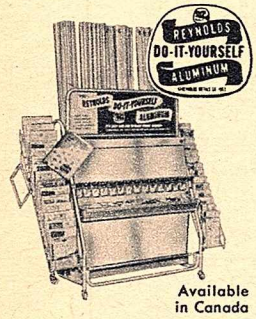
J. Hewitson, Verdun, Canada . . . Loren Frazier, Ventura, Cal. . . . W. W. McKnight, Helena, Mont. . . . K. Sturgeon, Naperville, Ill. . . . Richard Lee, Montrose, Cal. . . . Peter McCowin, Seattle, Wash. . . . Capt. E. L. Dornsife, New York, N. Y. . . . George L. McBride,

[Continued on page 189]

Make it of Aluminum... the metal that lasts ...outdoors

It never rusts, rots or warps . . .





Available in Canada

Aluminum is at its best out-of-doors. Strong and rust-proof, it stays new in looks and performance. Its light weight makes it easy to handle or move about.

And when you use Reynolds *Do-It-Yourself* Aluminum there are extra advantages. You work it, easily, with just woodworking tools. Most jobs are well started for you because Do-It-Yourself Aluminum comes in pre-formed sheets (8 kinds), in tubes, bars, fittings, rods and special extruded shapes.

Use it outdoors this summer for trellises, downspout extensions, patio windscreens. In minutes you'll make driveway markers, hose or tool racks. And Do-It-Yourself Aluminum is the one material for making a screen house or screening a porch.

At hardware and lumber dealers. Call Western Union Operator 25 for the name of the one nearest you.

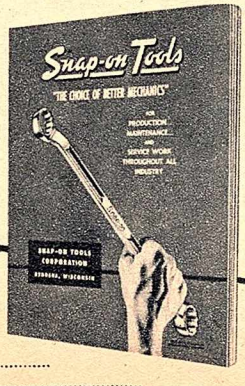
REYNOLDS *Do-It-Yourself* ALUMINUM

By the makers of Reynolds Wrap

REYNOLDS METALS COMPANY. 2491 SOUTH THIRD STREET, LOUISVILLE 1, KY.

See "FRONTIER," Reynolds exciting dramatic series, Sundays, NBC-TV

send for FREE tool catalog



A big, fact-packed catalog full of pictures and tool information . . . yours for the asking.

- *Snap-on* tools help you handle repair jobs faster, easier, better.
- *Snap-on* tools LAST . . . pay for themselves over and over.
- Used and endorsed by America's top-earning mechanics in all fields.
- Start building your *Snap-on* set with basic units . . . add other tools any time.

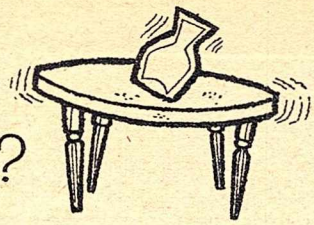
Snap-on Tools
THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION
8078-F 28th Avenue, Kenosha, Wis.

Send me free catalog.

OCCUPATION .....
NAME .....
ADDRESS .....
CITY .....ZONE .....STATE .....

Shaky table?



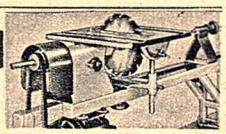
Build up short leg with *New* Plastic Wood. Makes a permanent fix that won't chip, crack or peel. And *New Improved* Plastic Wood has a finer grain – minimum shrinkage!

NEW "PLASTIC WOOD"®

Handles like putty—hardens into wood.

RETAIL PRICE $125.00

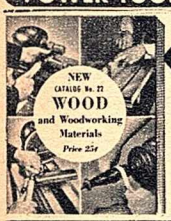
FACTORY TO YOU $79.95



SUPERSHOP includes precision-built 8" tilting table saw, vertical and horizontal drill press, 30" lathe, sander, grinder. 100% BALL BEARING. Write for FREE catalog, full details, trial plan.

POWER TOOLS, INC.

684 Yates Avenue, Beloit, Wisconsin



Get New 128 Page Catalog of

WOOD AND WOODWORKING MATERIALS

WORLD'S LARGEST SELECTION–Lowest Prices

Your buying guide for finest kiln dried domestic and rare imported woods, inlays, bendings, matched plywood, mouldings, ornaments, etc. Biggest selection of tools and hard-to-find hardware. Packed with scroll saw patterns, projects, wood facts and money making ideas. Enclose 25c (refunded on first order) to help pay mailing and handling costs. Write today to

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. G-6, Chicago 8, Ill.

BUILD D.C. WELDER

WE SHOW YOU HOW to build 350 amp. welder for your shop or farm from surplus aircraft generator. NO REWINDING NECESSARY! Guaranteed workable plans 50c. Easy and cheap to build. Includes FREE "How to Weld" booklet (reg. $1.00) and War Surplus & Electrical Catalog. SEND 50c TODAY for this $1.50 value!

LEJAY Mfg.Co., 1223 LeJay Bldg. Minn.8.Minn.

"SPEEDY" DRILL GRINDING GUIDE

MAKE OLD DRILLS LIKE NEW...

For repointing dull and broken twist drills up to 1/2" in diameter. One piece cast Aluminum. Simple. Anyone can use it. Order yours to-day. $1.00 postpaid.

BRASS CASTING CO.
P. O. Box 3056 Memphis 9, Tenn.

$1.00 POSTPAID

BOAT KITS 28 MODELS–8 to 19 ft. $39 up–FREE FREIGHT

SAVE 2/3!

Easy-to-build MAHOGANY FRAMES-DECKS
19' CRUISER KIT $499.50!
SEND 10¢ for KIT CATALOG!
Includes Hardware -Trailers-Fiberglas

BOAT PLANS-Patterns-Frame Kits

Craig-Craft Tonawanda, N.Y.

Build over 50 modern boats from large scale plans, available with FULL-SIZE patterns, new PRE-FAB frame kits! All types: prams to cruisers, 6 to 25 ft. Best buy for Amateurs! SEND 10¢ for CATALOG.

Strike It Rich

[*Continued from page* 180]

fall again. This simply means that the 6199 is drawing more current than the HV circuit can supply, which in turn is dependent on the voltage supplied. This means that you need less resistance in series. Connect the HV lead to a tap on the HV divider, which is nearer to the vibrator, and try again. Keep doing this until you find the point that will allow the needle to read full on the first range and stay there, even with a highly radioactive sample, and when you remove it the needle should again drop to a low reading. In this circuit, the design is such that the needle moves up faster than it moves back. It is better this way because we want the set to give an immediate reading when placed in a radioactive field. The time it takes the needle to swing back is not nearly as important as the time it takes to swing up.

The best method of setting up the scintillometer is by first turning on the two switches and allowing about one minute to warm up. Adjust the range switch to the No. 2 position. Next, adjust the bias control for a full reading on the meter, and very slowly back it off until the needle jumps back to a lower reading. Continue adjusting in the same direction as long as the needle keeps moving down. When the needle stops moving you have arrived at the correct setting for the bias control. Now adjust the zero control so that the meter reads just a little above zero. The set is now ready to be used on this range. When you change the position of the range switch, you may have to readjust the zero control. Once the bias control has been adjusted you should not need to touch it again unless the batteries become worn. In six months we have found that the only batteries that needed replacing were the ones used in the vibrator circuit.

When you have completed the instrument to your satisfaction close up the cabinet and tighten all screws and stand back and admire the work you have just done. You have built a truly wonderous device; an instrument that may well make you as rich as it has made many other people. •

[*See Parts List on opposite page*]

PARTS LIST

METER AND COUNTER

1 Cabinet; ICA #29801
1 Meter 200 microamps; Weston model 506
1 Switch 6pos 2 ckt; Erie #3612-03
1 Switch 2pos 4 ckt; Mallory #3242J
2 1N64 xtal diodes
2 1U4 tubes
2 Sockets with shields, 7 pin miniature
1 Transistor CK722
1 Transistor CK721
1 Control 10,000 ohms, small
1 Control 2,000 ohms W/W, small

All Resistors ½ watt 10% or better

2 560 ohm
1 1,000 ohm
1 1,300 ohm
1 1,500 ohm
1 27 K
1 56 K
1 82 K
1 150 K
1 390 K
1 470 K
1 2.2 meg
1 4.7 meg
1 6.8 meg
1 10 meg
1 20 meg

Condensers

2 100 mmfd
1 200 mmfd
2 0.01 mfd
1 0.03 mfd
1 10 mfd 10 volt; Electro

Batteries

3 Flashlight, size D cells
1 RCA VS068, 6 volts or equiv.
1 Eveready 467, 67½ volts or equiv.

HIGH VOLTAGE CIRCUIT

1 Vibrator HV supply; model # MVT-10
1 HV selenium rectifier; Bradley # SE245
1 Toggle switch
6 10 meg 2 watt resistors, 10% or better
3 0.01 mfd condensers, 6,000 volts

PROBE UNIT

1 10 in. length steel tube, 2-in. dia.
1 10 ft., 3 wire shielded cable (2 wires plus shield)
1 Duodecal socket; Cinch Jones # 3B12
1 #6199 RCA Photomultiplier tube
1 Thallium activated sodium iodide xtal 1 in. dia., ½ in. thick
2 oz. tube silicone grease
1 Aluminum can to hold xtal (use old filter can, 1⅜ in. dia., rip open and clean out)
3 220 mmfd condensers
1 20 meg ½ watt; 5%
9 10 meg ½ watt; 5%

NOTE: MECHANIX ILLUSTRATED has made a special arrangement whereby readers may purchase all parts of the Scintillation Counter as a kit for $110.00, plus postage, from Lafayette Radio, 100 Sixth Avenue, New York 13, N. Y.

NOW AUTOMATIC POWER LUBRICATION FOR YOUR CAR

WITH THE NEW

Multi-Luber

If you own a late model Ford or Chevrolet, this is for you. With a mere press of a button on your dash, all chassis points are high pressure lubricated in seconds . . . guarantees that smooth "Just Lubricated" ride *every day* . . . provides wonderful, time-saving convenience . . . adds years of economical car operation. The Multi-Luber has been exhaustively tested and is available on current models of one of the largest car manufacturers.

Buy it installed from your car dealer, garage, or service station—or install it yourself. Kit includes complete instructions for quick and easy installation.

Slightly higher in Canada

IN KITS AS LOW AS $46.95 PLUS INSTALLATION

LINCOLN ENGINEERING COMPANY, St. Louis 20, Mo.

Please send me your illustrated leaflet describing MULTI-LUBER, and the name and address of my nearest Multi-Luber Dealer.

NAME.....

STREET.....

CITY.....STATE.....

(Please print or typewrite)

[Continued from page 153]

Excellent illustrations in the instruction booklet adequately cover the loading operation.

After loading, the exposure counter is set at 16 for a regular 20-exposure roll, or at 29 for a 36-exposure roll. These being the number of stereo pictures you get per roll of 35mm film. As you shoot, the exposure counter will tell you how many pictures you have left, *not* how many pictures you've taken. We prefer it the other way around—the way it is on most cameras —with the exposure counter telling how many pictures have been taken.

The film advance and rewind knobs are large enough so that they are easy to manipulate. As the film is advanced the shutter is automatically readied for the next exposure. If the film is not advanced the shutter will not operate. Good for preventing double exposures.

Rewinding is easy. There is a little button next to the exposure counting wheel that is depressed and turned to the R position and the rewind knob is turned in the direction of the arrow.

There is a socket on the bottom of the camera for mounting on a tripod. And on the shutter button, provision is made for inserting a cable release.

Taking indoor flash pictures with the Stereo Graphic requires a minimum of photographic knowledge. First of all the camera is sold complete with the flash unit. And it is attached by sliding it into the clip on the top of the camera. Contact is made in the shoe without need for extra cables or wires. Care should be taken not to have a bulb in the flash unit while attaching it to the camera—it might fire. The camera is synchronized for M type bulbs. There is no provision for X or zero delay synchronization.

The camera is easy to handle and fits into the hands comfortably. It is sold with a leather case and the above mentioned flash unit. For its price of $79.50, it's a pretty good buy for the beginner in photography whose technical knowledge is limited.

The Sekonic Miniature

In these days of miniaturization it was only a question of time before exposure meters felt the squeeze. And, the most "squeezed" meter we have seen to date is the Sekonic Compact exposure meter imported from Japan by Spiratone, Inc. of 135-06 Northern Boulevard, Flushing 54, New York. Complete with a leather case it sells for less than $10.

This meter which measures 1¼ by 1¾ inches and is only ⅞ in. thick, has a clip designed to fit the standard accessory shoe on most American and foreign cameras. It is calibrated for ASA speeds from 10 to 800; shutter speed possibilities go from 4 seconds to 1/1,000th of a second. The diaphragm values range from f-1.0 to f-32. A translucent screen enables the meter to be used for incident light work. From a mechanical standpoint this meter seems to be very well designed with evidence of good machine shop practice present.

The Retina IIIc

Eastman's latest, the Kodak Retina IIIc camera, seems to have been designed to anticipate every possible improvement a miniature camera could expect to have in the next five years. In addition to a built-in exposure meter, the range finder is coupled with the view finder. The front element of the taking lens can be removed so that interchangeable lens components for telephoto and wide angle work can be installed. The meter is ingeniously designed so that it can be used under very poor light conditions. To use the meter a ring is turned so that a pointer to which it is attached is directly over the needle actuated by the light cell. The correct shutter speed will then lie opposite the appropriate diaphragm setting.

Some other features about the camera which impressed us were the rapid wind lever, the built-in self timer, the close focusing range, the slow speeds (up to one second) the built-in film indicator and the flash synchronized shutter (electrical contact however is made through a cord, not through a shoe as with some cameras).

The camera, made in Germany and imported by the Eastman Kodak Company of Rochester, New York sells for $190.00. A leather "eveready" case costs $13.50. •

—Walter Chandoha

Cooling For Your Home

[*Continued from page* 179]

so that a remote installatino of this sort is possible. Manufacturers do not, however, recommend duct lengths of over ten feet for maximum efficiency. A duct may also be used with ceiling mounted fans. With the inlet, motor and impeller in the ceiling, a duct leads through the wall space of a room above to an exhaust capped with a suitable cover on the roof. The duct can also go directly through an unfinished and unvented attic space to the roof.

Another variation involves mounting the inlet in a ventilating hood placed over the burners. Or for that matter it can be placed in the lower shelf of a kitchen cabinet over the stove with a duct connecting it to a wall or ceiling outlet. The duct may be neatly hidden in the cabinet in this installation. Either scheme will provide completely satisfactory results.

Whatever the fan type you choose and regardless of where you mount it, periodic service will guarantee that you will receive years of satisfactory operation. The points to check are:

The blades and centrifugal impellers should be cleaned with a good grease solvent.

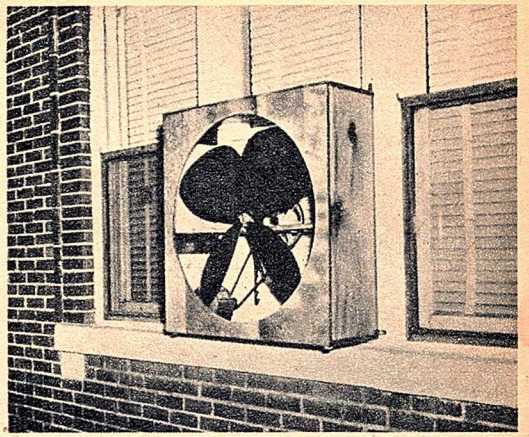
Motor bearings should be lubricated with a high grade motor oil, of a weight specified by the manufacturer, once a year.

The V-belts of indirect drive fans should be adjusted for proper tension (about one inch of slack).

Electrical wiring and connections should be looked at once a year and checked for tightness, fraying and burns.

Hold down nuts, screws and bolts of attic and kitchen fans should be checked seasonally as should the various nuts and bolts on window fans. Care in this connection will prevent noise.

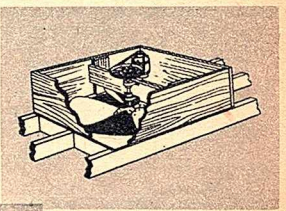
If you have carefully selected a fan with a proper rating for the job you want it to do, have properly installed it, and keep it well serviced and clean you will enjoy many years of trouble-free service. And you will in the long run save yourself money on expensive cleaning, redecoration and home maintenance bills to say nothing of the cool comfort you will experience in the summer. •

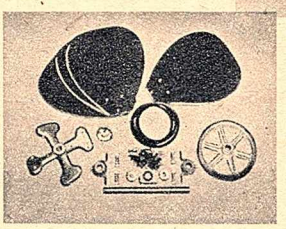


FEW DOLLARS BUILDS A BREEZE
WITH EASY TO ASSEMBLE FAN KITS

SAVE UP TO 75% on WINDOW & ATTIC FANS

The New All-Purpose Fan Kits insure dependable performance as Window Fans or for Standard and Horizontal installations in attic. No additional parts needed.





KITS OF PARTS, with step-by-step instructions, include: Aluminum fan spider, Masonite blades, Shaft, Oilite bronze bearings, collars, pulleys, belt and bolts.

No special tools or skill are required to install your own modern home cooling system . . . Invigorating, refreshing outside breezes can now cool your home at the lowest price ever. The Fan Kit, assembled with ease by thousands and sold on a money-back guarantee, is now built for window and Standard or Horizontal attic installation. Thoroughly tested for dependable performance, every kit includes all the parts you need plus complete instructions. The only additional requirements are a few pieces of lumber for fan housing and a new or used ¼ HP 1750 RPM motor.

Sizes are available for every need.

30″ Fan cools average home, 6000 CFM **$14.95**
36″ Fan cools larger homes, 8000 CFM **$17.95**
24″ Fan cools smaller homes, 4500 CFM **$13.95**
20″ Fan cools Apts., Offices, etc. 2800 CFM **$12.95**

You buy direct from Manufacturer. Orders accompanied by check or money order shipped postpaid. Deposit of $3.00 required on C.O.D. orders. Immediate delivery. Satisfaction guaranteed. Circular Free. Dealer inquiries invited.

FAN KIT COMPANY
154-A, NO. BELVEDERE
MEMPHIS, TENN.

HUNTERS! CONFISCATED RUSSIAN RIFLES $14.95

RUSSIAN RIFLE AMMUNITION FREE

20 rounds full jacketed ammo included with each rifle purchase. Additional cartridges: $7.50 per 100 rds. This ammo is for the Russian Moisin 7.62 MM, and also for the Moisin Nagant. We also now have 7.62 MM softnose hunting ammo., 150 gr. for deer, bear and No. Amer. big game, 20 rds. $2.95.

GOLDEN STATE ARMS CORPORATION
156 ARMORY BLDG., 1165 E. Colorado St., Pasadena, Calif.

This is the late Russian Model 7.62 MM Moisin Rifle, appr. 30" barrel. Mechanically perfect. Outside: good. Bore: fair. Ballistics: 2820 FPS with 150 grain bullet. Ammunition available everywhere in U.S., an excellent hunting cartridge. Hinged floor plate. Russian ordnance marks on receiver. The Russians won the International Meet in Venezuela (1954) with this model rifle. These guns were confiscated from Communist revolutionaries and placed on the free world market. They are of the type used by Red Chinese in Korea. The sale of these guns in no way aids any country behind the iron curtain. A Once-In-A-Lifetime collector's item. This is the lowest price we have ever seen which would allow a man to equip himself for big game hunting. For C.O.D. send $5 deposit. Calif. residents add 4% state tax.

Wholesale! TOOLS! GUNS! CAMERAS!

BUY TOOLS, PHOTO EQUIPMENT, SPORTING GOODS, JEWELRY AND THOUSANDS OTHER NATIONALLY ADVERTISED PRODUCTS AT BIG DISCOUNTS. SAVE ON OWN PURCHASES. BIG PROFITS SELLING TO OTHERS. POSTCARD BRINGS FREE COPY "THE WHOLESALE PLAN!"

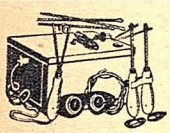
Get up to 40% off

AMERICAN BUYERS SERVICE
Hertel Station, Dept. 19, Buffalo 16, New York

DO MORE PLANING JOBS WITH LOW COST BELSAW

LOW DOWN PAYMENT EASY TERMS

Exclusive MONEY-MAKING Features: Full 12¼" x 6" capacity • Power feeds at 14" to 34' a minute • Provides for Grinding Knives in the Cutterhead • Attachments for Jointing, Rabbeting, Tongue, Matching, Groove. Convert low cost rough lumber into high priced stock. Easy to make flooring and popular patterns. Send Today for FREE Literature and Prices.
Belsaw Machinery Co, 2046 Field Bldg., K.C. 11, Mo.



ELECTRIC WELDER AC or DC 110 Volt

The "Little Marvel" all-metal welder. 5-year written guarantee. Welds ⅛" metal or money back. Repairs tanks, tools, fenders, machine parts, etc. Complete with everything —rods, unit, eye shield, directions. $6.95 plus 50c postage. Flame torch accessory for soldering, cutting, brazing $3.95 complete with carbons, brass rods, flux. $2.00 deposit on C.O.D. ¼" 75 amp. Transformer Welder $21.95 F.O.B.
ESSAY MFG. CO., Dept. 101, Quincy 69, Mass.

$6.95 Complete

14' Model Pictured

42 TOP PERFORMING MODELS, 8' thru 18' . . from $39.25 incl. frt.

FREE! BOAT KIT CATALOG

Runabouts, Cruisers, Convertibles, Fishing, etc., for every purpose with modern styling, advanced design. No experience necessary, amateurs can easily assemble. Save ½ to ⅔ "factory-built" prices!

FIBERGLAS, TRAILERS, ACCESSORIES

LUGER INDUSTRIES, INC. DEPT. D-6 — 3404 Lyndale S. Minneapolis 8, Minn.

KING MIDGET
World's Lowest Priced Car!

NOW—32 PAGE BOOK filled with photos, drawings, specifications, records, wholesale price, and Rider Agents plan if no dealer near you. Send 25c for book, or send $1 (refunded first order) for it plus actual operating book and service manual.

MIDGET MOTORS MFG. CO., ATHENS 3, OHIO

Bonnie II

[*Continued from page* 168]

For auxiliary power the boat has a 2½-hp, air-cooled, 4-cycle, single-cylinder engine. Made by Briggs and Stratton, it weighs just 40 lbs. and is priced at about $52. This engine, with the throttle control located conveniently on top, will move the boat along smoothly at about five knots. A 2:1 reduction gear cuts the boat's speed to less than one knot for trolling, yet allows the engine to operate efficiently within the recommended rpm. The reduction gear is fabricated from stock bearings and pulleys and mounted on a non-corrosive frame with the engine. A simple, two-position clutch connects the engine to the shaft. Incidentally, the 9x6-in. propeller, bronze shaft and stuffing box were bought in a surplus marine center for less than $10.

Construction of the engine mount is detailed in two drawings. The engine stringers are notched into the floor beams and frames and leveled off. As the bottom slopes upward toward the stern, the notches at frame No. 5 will have to be somewhat deeper than those at No. 4 to accomplish this. When it is done, the stringers are lag-screwed to the frames. The exact angle of the triangular pieces on which the engine rests will have to be determined on the job. When it is accomplished, temporarily bolt the pieces in place on the stringers and place the engine upon them.

Determine the spot where the shaft will go through the bottom of the boat and cut a 1-in. wide slot through the keel and keelson at this point. The skeg drawing shows about where this slot will be, though it will vary slightly in different boats. Make the skeg as shown, assemble with screws and marine glue and shape the top to fit flush

against the keel. Also, be sure the slot in the skeg is roomy enough so that the shaft will not bind.

Place the skeg up against the keel and wedge it in place with a stick between it and the floor. Then get down on hands and knees and peep through the shaft hole to see if it lines up with the engine coupling. A light shining on the coupling facilitates this work. If the shaft opening is in correct alignment, the coupling will appear as a perfect circle in the exact center with none of its inside walls visible. However, chances are that some adjustment of skeg and motor will be required before everything lines up. When you think you have it, run the shaft itself into the opening and push it into the coupling. It should go in quite easily if the lineup is correct. Check to see that it revolves freely without binding and, when satisfied, bore holes through the keel from the inside for the lags and bolt that will hold the skeg on. Then remove the skeg and cut a canvas gasket to fit between it and the keel, allowing a hole for the shaft. Soak the gasket in marine glue, put it in place and fasten the skeg. Then replace the shaft and secure the engine permanently.

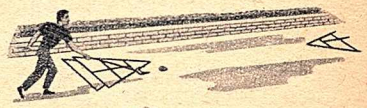
The rudder is extremely simple, being cut from a piece of ¾-inch fir plywood to the shape and dimensions given in the drawing. The tiller may be either mahogany or oak. It is held to the rudder by side pieces of oak. A single carriage bolt pivots the tiller assembly on the rudder, allowing free up and down movement and easy disassembling.

The inside of the cabin and cockpit will not be described in detail, as each builder will have his own ideas about how he wants them arranged. However, a few general suggestions may be of help. You will probably want two bunks in the cabin and there is ample room. Let them run from the aft cabin walls forward and diagonally in toward the center of the boat until they almost meet in front of the mast step. This latter, by the way, should be put in before the bunks and fastened to the keel with two carriage bolts run through from the outside.

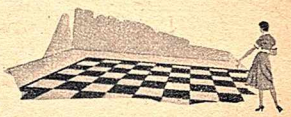
It is suggested that two seats be installed lengthwise on either side of the cockpit, at a convenient height. Plywood, ½ or ¾-in.

[*Continued on page* 188]

AT LAST! Make Floors, Patios, Driveways and Walks Look Different — use ROX



TESTED FOR YEARS



Something *new* and *exciting* in decorating! Now Rox shows you how to design a shuffleboard, a hopscotch block and many other interesting or decorative patterns for porches, basement floors, driveways and patios. Or, if you are tiling your floor, seal out moisture with Rox first. And remember . . . *Rox is guaranteed not to blister or peel!*

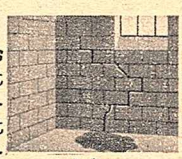
Beautiful, Durable Exteriors with ROX

Before

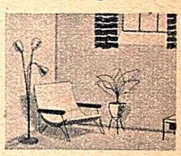
After

Masonry walls absorb tons of water—this water, if not kept out, can deteriorate masonry. Rox becomes part of the masonry surface itself as it seals this surface and protects against water even in gale driven rains. Rox adds distinctive exterior beauty.

Guaranteed Protection Against Water Leakage!



Before



After

Rox *guarantees* to protect your basement against water leakage. Convert it to a usable recreation room or workshop where tools are safe from moisture with Rox.

Helpful Booklet

Illustrated in color to help you apply that professional decorator touch as you protect and beautify your basement and masonry surfaces. Diagrams and explanations to make shuffleboard and other games or decorative designs on floors, patios, driveways, walks, etc., and give new interest to masonry walls. Send 15c for handling. *Available in 5 colors and white at authorized Rox dealers in U. S. and Canada or write Rox Products Co., Dept. M16, Detroit 27, Michigan.*

© ROX PRODUCTS CO.

[Continued from page 187]

thick, is ideal for flooring, both in cabin and cockpit. Cabin floors are supported by the floor beams. In the cockpit it will be necessary to screw extra supports to the beams and cut the floor boards to fit around the motor. Incidentally, if you decide to pipe the exhaust out through the transom, a hole should be cut in one of the floor boards to allow the pipe clearance. Flexible metal exhaust tubing is obtainable at most marine supply stores.

Moldings conclude the woodwork. Use 1-inch quarter-round along the deck cabin seam, and 1-inch half-round along the deck-topsides seam and cabin roof seam. Set all molding in Kuhl's bedding compound and fasten with countersunk, plugged screws.

Dick Donohue picked up his mast, boom, sails and rigging secondhand for $75. For those of you who might not be so lucky, spar construction is detailed in the drawings. Note the use of filler blocks in the hollow mast wherever hardware is used. Mast and boom are finished with four coats of top-grade spar varnish, sanding lightly between coats.

A paint job completes the boat. The last touch is the final coat of bottom paint which is applied just before going overboard. •

BILL OF MATERIALS, BONNIE II

Quantity	*Dimension*	*Use*
MARINE PLYWOOD		
1 panel	3/8"x4'x12'	Side planking
1 panel	3/8"x4'x8'	
2 panels	3/8"x4'x12'	Bottom planking
2 panels	3/8"x4'x8'	
2 panels	3/8"x4'x12'	Decks, cabin roof, hatches and joiner work
2 panels	3/4"x4'x6'	
1 panel	3/8"x4'x12'	Cabin sides, back, doors and splashboard
1 panel	3/8"x4'x8'	
1 panel	3/4"x4'x6'	Rudder, centerboard, skeg sides, jumper strut
OAK		
1 piece	7/8"x2"x9'	Cabin roof beams
1 piece	7/8"x5"x16'	Keel
1 piece	7/8"x5 3/4"x3'	Skeg core
YELLOW CEDAR		
1 piece	3/4"x7 3/4"x16'	Keelson
2 pieces	7/8"x1 3/4"x19'	Sheer battens
2 pieces	7/8"x2 3/4"x18'	Chines
2 pieces	3/4"x2 1/4"x18'	Deck longitudinals
1 piece	7/8"x1 3/4"x9'	Cabin roof stringers
PHILIPPINE MAHOGANY		
60 lin. ft.	7/8"x2 5/8"	Frames
1 piece	3"x6"x6'	Stem
1 piece	3"x6"x8"	Mast step
1 piece	3"x8"x8"	Mast pardner
1 piece	3/4"x3"x12'	Transom frame
1 piece	2"x7 3/4"x3'	Transom knee
1 piece	1 1/4"x8"x2'	Breast hook, stern knees
1 piece	1 5/8"x3 5/8"x10'	Centerboard bed logs
1 piece	1"x3"x6'	Centerboard trunk ends
2 pieces	3/4"x2 1/4"x10'	Hatch slide rails and ends
1 piece	1 5/8"x2 3/4"x4'	Tiller
2 pieces	3/4"x12"x9'	Centerboard trunk
29 lin. ft.	3/4"x8"	Transom and cabin front
FIR		
1 piece	1 1/8"x5 3/4"x12'	Deck beams
1 piece	1 1/8"x2 1/4"x18'	Cabin uprights
35 lin. ft.	3/4"x3/4" sq.	Cabin roof carlins
50 lin. ft.	1" half-round	Molding
30 lin. ft.	3/4" quarter-round	Molding
1 piece	2"x2"x6'	Engine stringers
SITKA SPRUCE		
2 pieces	1/2"x3"x28'	Mast
2 pieces	3/4"x3"x28'	
1 piece	3/4"x4"x9'-3"	Boom
FASTENINGS		
2 gross	2" No. 10	Flathead brass screws
6 gross	1 1/2" No. 10	
6 gross	1 1/4" No. 8	
1 gross	1" No. 8	
1 gross	3/4" No. 8	
14	4 1/2"x5/16"	Carriage bolts
18	6"x1/4"	
7	7"x5/16"	
4	2"x5/16"	
12	3"x5/16"	Lag screws
6	5"x5/16"	
FITTINGS AND HARDWARE		
Note: numbers in parentheses are taken from the catalog of Armstrong and Galbraith, Inc., 226-228 Fourth Avenue, New York 3, N. Y.		
2	5" diameter (317)	Forward portlights
5	5" open base (544)	Boat cleats
2	4" (546)	Bow chocks
1	4" (119)	Straight chock (stern)
1	No. 2 (608)	Mooring bit
2	Size No. 0 (1071)	Pintles
2	(1073)	Plate gudgeons (rudder)
6	5/16" (459)	Rigging turnbuckles
35'	5/8" (1849)	Sail track
1		Gooseneck to accommodate boom
4	8" (569)	Chain plates
2	1/2"	Lip leaders
1	2" diameter (892)	Masthead sheave
1		Stemhead plate
1	(1047)	Clew outhaul
1	No. 6 (51)	Fast eye block
2	No. 5 (100)	Swivel eye blocks, single
1	No. 1 (827)	Centerboard block
2 sq. ft.	1/8" Plexiglas	Ports
60"	1/8"x1 1/2"	Bronze strap (tangs)
150'	1/8" diameter	Stainles steel wire

MISCELLANEOUS

2 quarts copper bottom paint; 1/2 gal. Cascophene waterproof glue; 1/2 gal. yacht white; 1/2 gal. blue marine deck paint; 1/2 gal. canvas cement; 1/2 spar varnish; 2 lbs. Kuhl's elastic seam compound; Mahogany stain and filler; 1 qt. red lead; 1 pt. Kuhl's trowel cement.

When answering advertisements please mention

MECHANIX ILLUSTRATED

Golden Hammer Awards

[Continued from page 181]

Venice, Cal. . . . Robert W. Allen, Olympia, Wash. . . . Emilio Iannuzzi, New Rochelle, N. Y. . . . Howard Dickinson, Auburn, Mass. . . . James Eggers, Little Rock, Ark. . . . Kent Elworthy, Erlangen, Germany . . . Richard McBroom, Van Nuys, Cal. . . . Rudolph Palumbo, Corona, N. Y. . . . Fred DeBoer, Chicago, Ill. . . . Bill Inbody, Findlay, Ohio . . . C. F. Cadegan, Wexford, Canada . . . Earl Kincaid, Jr., Geneseo, Ill. . . . Howard Murphy, Milton-Freewater, Ore.

Watch for the names of more winners next month. •

Telescope Maker's Page

[Continued from page 143]

going to work with and come up with a mild form of conjugate magnification.

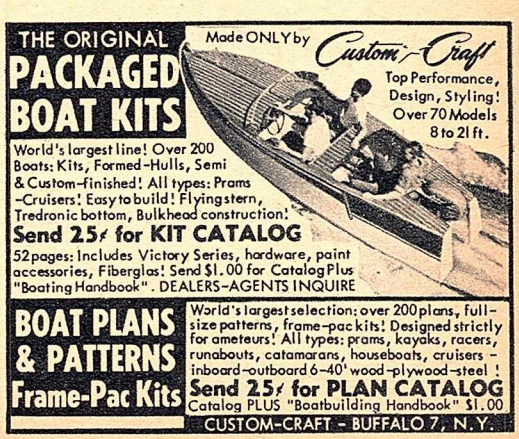
From scope No. 2, remove the two screws that hold the large Kellner ocular and unscrew it from the tube. Now unscrew the headless screw which secures the reticule assembly within the eyepiece assembly. This is at the "field" or large end of the eyepiece. After removing the reticule assembly replace the ocular in the tube. If you want cross hairs in your scope leave it in. But remove the reticule from the second Kellner.

Now, let's recapitulate to avoid any mistakes. So far, we have been at work on the powerful erecting or ocular end of the scope which is contained in the 11½-in. length of tube with the iron collar. In addition to the ocular (with the reticule removed) which will be the "eye" end of this scope, we have left in the tube one of the erecting achromats. We now screw the second Kellner ocular obtained from scope No. 2 into the other end of our 11½ in. tube, leaving one-quarter inch of threads exposed.

Let's take a look at the upper or discarded half of the M-70. We discarded the single element lens near it, for it has little "light grasp." But we do remove from this front tube assembly the 1½-in. coated achromat in its brass cell block found at the other end of the tube (see E) for this is to be the main objective of our converted telescope. This OG is so well designed. It will stand high magnification without breaking down in performance in its new role. Most of the optics in the M-70 were made by Bell and Howell and other noted optical houses.

[Continued on page 190]

Now! Cover plywood edges with real wood
New Flexible
Weldwood® Wood-Trim*
Avoid unsightly edges in building any plywood project—tables, desks, cabinets, etc. Give them a "pro" finish with Weldwood Wood-Trim. So flexible you can beautify any edge—straight, curved, angled. In handy rolls, Wood-Trim is a cinch to apply. No clamps, nails, hot iron, etc. Just use Weldwood Contact Cement or Presto-Set® Glue.
Countless Decorating Uses!
Trim lamp shades with Wood-Trim! Decorate picture frames! Smarten coffee tables, clocks, waste baskets, etc. 8 ft. rolls 1" wide. Oak, African Mahogany, Walnut, Birch, Fir, Korina.
For perfect wood finishing jobs, use FIRZITE and SATINLAC
Another Weldwood Wizard
At hardware, paint, lumber dealers. Write for free leaflet to Dept. MI 6-6 WT.
*Trade Mark
UNITED STATES PLYWOOD CORP., BOX 525, NEW YORK 46


THE ORIGINAL
PACKAGED BOAT KITS
Made ONLY by Custom-Craft
Top Performance, Design, Styling! Over 70 Models 8 to 21 ft.
World's largest line! Over 200 Boats: Kits, Formed-Hulls, Semi & Custom-finished! All types: Prams -Cruisers! Easy to build! Flying stern, Tredronic bottom, Bulkhead construction!
Send 25¢ for KIT CATALOG
52 pages: Includes Victory Series, hardware, paint accessories, Fiberglas! Send $1.00 for Catalog Plus "Boating Handbook". DEALERS-AGENTS INQUIRE
BOAT PLANS & PATTERNS
Frame-Pac Kits
World's largest selection: over 200 plans, full-size patterns, frame-pac kits! Designed strictly for ameteurs! All types: prams, kayaks, racers, runabouts, catamarans, houseboats, cruisers - inboard-outboard 6-40' wood-plywood-steel!
Send 25¢ for PLAN CATALOG
Catalog PLUS "Boatbuilding Handbook" $1.00
CUSTOM-CRAFT - BUFFALO 7, N.Y.

OPTICAL BARGAINS

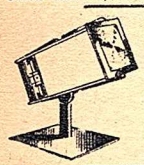
War Surplus Liquidation!

M-17 8 POWER ELBOW TELESCOPE

Perfect for Telephoto Shots
$200 Value for Only $12.50 Postpaid

Amazingly brilliant viewing! This is the same telescope being used to track guided missiles. A previous issue of MECHANIX ILLUSTRATED featured a story on how to use this scope as a telephoto lens. We'll furnish a direction sheet telling how you can adapt cameras with removable lenses. Scope has big 2" objective—Kellner eyepiece—Amici erecting prism—4 built-in filters—reticle illumination. Excellent for finder on an astronomical telescope. Easily mounted for terrestrial observation—viewing mountains, ships, scenic views, etc. The focusing 28mm F.L. eyepiece alone is worth more than $12.50.

Stock No. 70,065-B .....$12.50 Postpaid



BUILD A SOLAR ENERGY FURNACE!

A fascinating new field. You can build your own Solar Furnace for experimentation—many practical uses. It's easy—inexpensive. We furnish instruction sheet. This sun powered furnace will generate terrific heat—produces many unusual fusing effects. Sets paper aflame in seconds.

Stock No. 80,040-B . . . Fresnel Lens, size 11¾" x 16½"—f.l. 19" .....$3.50 Postpaid

SPITZ MOONSCOPE

A precision-made 32 power reflecting telescope —by the makers of Spitz Planetarium. Clearly reveals the craters of the moon, shows Saturn, Jupiter, other wonders of the heavens. Based on same principles as world's giant telescopes. Stands 36" high on removable legs. Adjustable 3" polished and corrected mirror. Fork type Alt-Azimuth rotates on full 360° circle—swings to any location in the sky. Fascinating 18-page instruction book is included. Instrument packed in sturdy carrying case.

Stock No. 70,068-B.....$14.95 Postpaid

WRITE FOR FREE CATALOG "B" !

Complete Line of Astronomical Telescope Parts and Assembled Telescopes. Also huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, binoculars, etc. Request Catalog "B"!

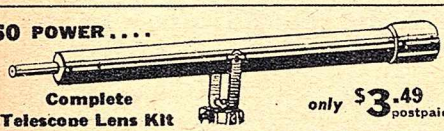
EDMUND SCIENTIFIC CORP., Barrington, N. J.

EVERYTHING FOR THE AMATEUR TELESCOPE MAKERS

MAKE YOUR OWN TELESCOPE WITH A MINIMUM OF TOOLS. Explore outer space. Complete kits from $4.50. Quality supplies guaranteed. Pyrex mirrors made to order. Send your mirrors to us to be aluminized with our new hardened Alchrome coating. PRISMS * EYE PIECES * ETC. Send for free catalog. Instruction book 10c.

PRECISION OPTICAL SUPPLY CO.
1001 East 163rd St., New York 59, New York

250 POWER....



Complete Telescope Lens Kit only $3.49 postpaid

Conquer Space, Explore the Universe, Planets, Moon Craters, New Stars, etc. Complete Lens Kit consists of 80 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford 1, Conn., Dept. ML-39

See the Greatest Show on Earth with this

GIANT ASTRONOMICAL TELESCOPE

$15.00 FULL PRICE

Delivered ready for use. Has 45X, 75X and 100 power individually mounted eyepieces with brass focusing tube plus sun projector lens for observing sun spots and solar storms. Steel telescope tube 50 in. long. Rigid 6 ft. tripod adjustable to any height. Steel forked mounting with closely machined aluminum tripod head assembly assures extra fine adjustments. This professional type instrument provides full power with clear vision at all times. See the moons of Jupiter, our own moon, planets, milky way, double stars, star clusters, etc. All for only $15.00 FOB Mattituck. Sent express. COD orders require $5.00 deposit. Satisfaction guaranteed. 200X and 400X eyepieces available at $2.00 each.

SUFFOLK SCIENCE SERVICE
DEPT. TM-6 MATTITUCK, N. Y.

Telescope Maker's Page

[*Continued from page* 189]

Obviously this converted job must have a push-pull focusing arrangement from the front end of the telescope instead of the conventional rear end method, but since the scope is only 22 in. long, focusing to infinity is very short.

Let's turn our attention to the second M-70 which we have cannibalized. We want the lower end of this tube, the one with the iron collar. Since the Kellner ocular has already been removed, and also the front end of the tube, all that is left inside the tube is the second erecting lens in a brass cell. Remove the three screws holding this cell and gently push the cell and lens out of the tube.

Place the empty 11½-in. tube in a vise and hack saw it off flush with the iron collar which yields a tube threaded at the one and about 6½ in. long (drawing D). This tube will be the front end of the new scope and will support our main objective. Screw the threaded end of this tube onto the exposed quarter-inch of threads on the second Kellner ocular in our eye erecting system. All threads are matching and will fit. The brass cell holding our OG has a split spring action and will fit nicely over a piece of standard brass plumbing pipe found at the

60 POWER TELESCOPE $3.98

VARIABLE EYEPIECE 20X-40X-60X—BRASS BOUND

NEW! Three telescopes in one. 3 different magnifications. 20 power for ultra-bright images with 40 and 60 power for extra long range. Guaranteed to bring distant objects, people, sports events, ships, moon, stars, etc. Most powerful for anywhere near the money. 5 Sections. Closes to 1 ft. long. Contains 4 60 times as ground and polished lenses. Also used close. as a powerful compound microscope. Directions included. Mass production enables us to offer this instrument at amazing price of $3.98. Nothing Else to Buy. We pay postage. Get yours at once.

CRITERION CO., 331 Church St., Hartford 1, Conn., Dept. BML-41

SKYSCOPE

The 3½" dia. reflector, astronomical telescope 100% American made. Completely mounted. Used by schools and universities for over 15 years. Unconditionally guaranteed. $29.75. Descriptive literature on request.

THE SKYSCOPE CO., Inc.
475-M Fifth Ave., 17, N. Y.

SAVE! BUY TELESCOPE PARTS DIRECT FROM MFGR.

FREE CATALOG UPON REQUEST. Finished Optics, all types of telescopic mountings and parts. Mounted Eye Systems and Diagonals, Grinding Materials, Pitch and Polishing Materials. Also assembled scopes; all sizes. Money Back guaranteed on all products. Dept. MI-6.

ESCO PRODUCTS
Oakridge, N. J.
Sales Showroom, 166 Church St., N.Y.C.

hardware store, the plumbers, or at any Sears store. For this, buy the standard six-inch length of chrome-brass pipe fitting with one end expanded to 1½ in. and the other end 1 in. in diameter. The cell with the OG fits over the smaller end and the longer end into the M-70 iron tube. This chrome-brass tube need be only 4½ in. long, as the focusing is short. Paint the inside of the chrome-brass tube a dead black. Now cut, from a tin can, a sleeve three inches in length. When placed over the expanded end of the short tube holding the OG it will produce a nice push-pull fit into the upper tube of the M-70.

You now have a 20 power terrestrial telescope. With the right hand grasp the chrome focusing tube at the front end and focus on an object. For near objects pull the focusing tube out, for infinity push the tube in. Focusing is very sensitive. •

—H. W. Metzger

NOW YOURS **A NEW DYNASCOPE REFLECTOR**

A Superior-Performing Professional-Model Telescope

with **BAKELITE TUBE** and **TWO (50X & 100X) EYEPIECES**

ALSO PORTABLE TRIPOD AND COMBINATION NON-FRICTION EQUATORIAL & ALT-AZIMUTH MOUNT!

Yes, it's really true! The latest scientifically correct reflector telescope with *all essential professional features*—A triumph of three years of painstaking tests and experiments for higher power, clearer definition and more durable service at lowest possible price! Never before anything like this new *DYNASCOPE* Reflector! A proud addition to Criterion's famous family of highest standard Dynascopes. Just match it against any other scope at $35 or even $40—for these *professional capabilities* and *advanced precision features:*

PROFESSIONAL CAPABILITIES! Guaranteed observatory clearness! Perfect portability! Prolonged trouble-free performance! *Automatically* follows the stars in their courses! In actual *controlled* tests, the new Dynascope out performs scopes of much, much higher cost, and larger diameter! Resolves most difficult celestial objects, Hundreds of Mountains & Valleys on the Moon, Red Face of Mars, Moons of Jupiter, Rings of Saturn, Star Clusters, in fact the finest double Stars.

ADVANCED PRECISION FEATURES! The MIRROR: 3-inch Newtonian Reflector, f 12.5, aluminized and overcoated, finished to exacting specifications and *guaranteed to perform to the Dawes' limit* for size of instrument! The TURE-36-inch BAKELITE, the strongest, finest insulator known—not subject to mercy of atmospheric changes! The EYEPIECE—not one but TWO *Ramsdens*—for 50 power and 100 power—both standard equipment! Also Cast Iron smooth-operating combination non-friction Equatorial and alt-azimuth mount specially constructed to guarantee perfect performance on this Dynascope—the very same as on fine instruments formerly sold at $44.95.

WE'LL BACK IT TO THE LIMIT! Here's your Unconditional Money Back Guarantee: You'll be more than satisfied, you'll be thrilled! You'll agree with the professionals: The Dynascope Reflector is the most flawless instrument made for its size! Ideal for serious amateurs, classrooms, and as a second portable instrument for professional astronomers! You'll agree too, with leading planeteria and hundreds of individual users who are on record praising Dynascope's incredibly superior performance and durability! You'll be as proud to own the new Dynascope as we are to offer it to you! Immediate shipment. Send check or money order today!

COMPLETE ONLY $27.95

F. O. B. Hartford, Conn. Shipping Wt. 9 lbs. Express Charges Collect

SEE JUST WHAT YOU GET

1-3" **MIRROR,** f 12.5, aluminized and overcoated, guaranteed to resolve to Dawes' limit for its size.

2-36" **BAKELITE TUBE.**

3-2 **EYEPIECES**—50X & 100X Ramsdens.

4-**CAST-IRON MOUNT.** Combination Non-Friction Equatorial & Alt-azimuth.

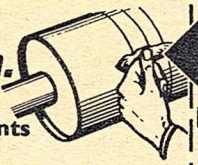
5-33" **TRIPOD** of finished hardwood.

- **MIRROR CELL**—Removable—Ventilated.
- Open end & eyepiece covers.
- Factory tested to "split" 2 seconds of arc separation; also Focault, Ronchi and final definition tests.
- A portable, completely assembled tested-quality instrument ready for immediate precision performance.

Other Accessories at Small Extra Cost —On Request

THE CRITERION MANUFACTURING COMPANY
Dept. DM8, 331 Church Street Hartford, Conn.

REPAIR MUFFLER AND EXHAUST LEAKS in 10 min.



The plastic gas-tight seal sets hard, withstands heat and vibration. Prevents carbon monoxide gas poisoning.

SETS LIKE A WELD—NO TOOLS NEEDED

$1.69 per can

Holt's GUN-GUM

MUFFLER PLASTIC SEAL*

Write for Full DETAILS

See Your Neighborhood Auto Accessory and Parts Replacement Store

TREGLOWN CO. INC, FANWOOD 84, N.J

* TRADE MARK REG. CANADA: 1368 GREENE AVE, MONTREAL 6 (Prices Higher)

Holt's **HAVE THE ANSWER!**

WORN ENGINE BURNING OIL!

Increases miles per gallon!

Restores compression!

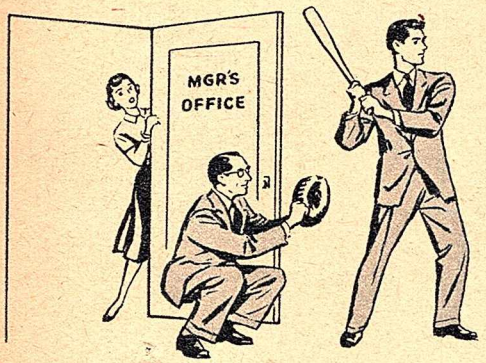
Reduces oil bills!

$4.95 Tube for most cars

Forms self-lubricating seal at piston top. Inserted through spark plug holes. Used by millions of motorists. Tested and approved by motoring experts.

* **PISTON SEAL**

How's your BATTING AVERAGE with the boss?



Are you still making a hit? Are you up for the job ahead? Here's a sure way to score in any league!

If your boss is like most, he's casting his critical eye on everybody these days. He wants to know how *you* stack up. Are you making good—or marking time? When the changes come, will you go up—or out?

This is no time for casual resolve. What you plan to do six months from now may be too late. You've got to prove your worth—NOW!

FOR REAL JOB SECURITY—GET I.C.S. TRAINING

The quickest, surest way to impress your boss is to show him that you're better equipped than the next guy. And here's where I. C. S. can go to bat for you!

I. C. S. training is approved training! Leading companies know it—and use it! At your request, your boss will get regular reports of your progress with I. C. S. More important, he'll notice the immediate improvement in your work.

LEARN IN YOUR SPARE TIME—SET YOUR OWN PACE

I. C. S. instruction is *personalized* instruction. No interference with other activities. No slow classmates to hold up your progress. You forge ahead as rapidly as your time and ability permit!

I. C. S. Courses are practical, up-to-the-minute. What you learn one night, you apply the next day. You get bedrock facts and theories *plus* everyday know-how. Graduates get the famous I. C. S. diploma—recognized everywhere. "I got a break over more experienced fellows because of my I. C. S. training," says M. A. D., Suncock, N. H.

QUICK WAY TO TEST YOUR EXECUTIVE ABILITY

Successful men know how to make decisions. Don't put it off! Mail the coupon today!

3 FREE BOOKS

Free, illustrated catalog outlining opportunities in the field that interests you. Also 36-page, pocket-size guide to advancement. "How to Succeed," a gold mine of helpful tips. Also, free sample lesson (Math).

For Real Job Security—Get an I. C. S. Diploma! **I. C. S., Scranton 9, Penna.** Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS — 65TH YEAR

BOX 85382E, SCRANTON 9, PENNA.

(Partial list of 256 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning—Refrig.
- ☐ Architecture
- ☐ Architectural Interiors
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Building Maintenance
- ☐ Carpentry and Mill Work
- ☐ Heating
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Cartooning
- ☐ Commercial Art
- ☐ Fashion Illustrating
- ☐ Magazine Illustrating
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Auto Body Rebuilding
- ☐ Auto Elec. Technician
- ☐ Auto-Engine Tune Up
- ☐ Automobile Mechanic

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Advertising
- ☐ Bookkeeping and Accounting
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Public Accounting
- ☐ Creative Salesmanship
- ☐ Federal Tax
- ☐ Letter-writing Improvement
- ☐ Office Management
- ☐ Professional Secretary
- ☐ Retail Business Management
- ☐ Sales Management
- ☐ Stenographic-Secretarial
- ☐ Traffic Management

CHEMISTRY
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Natural Gas Prod. & Trans.
- ☐ Petroleum Engineering
- ☐ Plastics
- ☐ Pulp and Paper Making

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Reading Struct. Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Mine Surveying and Mapping
- ☐ Plumbing Drawing and Estimating
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrical Maintenance
- ☐ Electrician ☐ Contracting
- ☐ Lineman

HIGH SCHOOL
- ☐ Commercial ☐ Good English
- ☐ High School Subjects
- ☐ Mathematics

LEADERSHIP
- ☐ Foremanship
- ☐ Industrial Supervision
- ☐ Leadership and Organization
- ☐ Personnel-Labor Relations

MECHANICAL AND SHOP
- ☐ Gas—Electric Welding
- ☐ Heat Treatment ☐ Metallurgy
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Supervision
- ☐ Internal Combustion Engines
- ☐ Machine Design-Drafting
- ☐ Machine Shop Inspection
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration
- ☐ Sheet Metal Worker
- ☐ Tool Design ☐ Toolmaking

RADIO, TELEVISION
- ☐ Industrial Electronics
- ☐ Practical Radio TV Eng'r'ng
- ☐ Radio and TV Servicing
- ☐ Radio Operating
- ☐ Television Technician

RAILROAD
- ☐ Air Brake Equipment
- ☐ Car Inspector
- ☐ Diesel Engineer & Fireman
- ☐ Section Foreman

STEAM AND DIESEL POWER
- ☐ Combustion Engineering
- ☐ Diesel—Elec. ☐ Diesel Eng's
- ☐ Electric Light and Power
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Finishing and Dyeing
- ☐ Loom Fixi'g ☐ Textile Des'ing
- ☐ Textile Eng'r'g ☐ Throwing
- ☐ Warping and Weaving

MISCELLANEOUS
- ☐ Domestic Refrigeration
- ☐ Marine Engineering
- ☐ Ocean Navigation
- ☐ Professional Engineering
- ☐ Short Story Writing
- ☐ Telephony

Name_____ Age_____ Home Address_____

City_____ Zone_____ State_____ Working Hours_____ A.M. to P.M._____

Occupation_____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

PRINTED IN U.S.A.